THE MOOC MODEL FOR DIGITAL PRACTICE:

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Executive Summary

Introduction

The MOOC Model for Digital Practice responds to the "Building Digital Skills for Tomorrow" section of the consultation paper Improving Canada's Digital Advantage: Strategies for Sustainable Prosperity by synthesizing the current state of knowledge about Massive Online Open Courses (MOOCs). It argues that building and sustaining prosperity through Canada's current digital strengths depends on a digital ecosystem that embraces both infrastructure and the collaborative social networks enabled by that infrastructure. Prosperity in this context requires a citizenry with the knowledge, skills, and attitudes necessary to turn these factors towards creating wealth. By exploring the relationship of MOOCs to the digital economy in general and their potential roles to prepare citizens for participation in that digital economy in particular, it illustrates one particularly Canadian model of how these needs may be addressed.

In keeping with the multimodality and the alternatives to "traditional" modes of presentation enabled by digital technologies and integral to the development of the digital economy, our knowledge synthesis has supplemented the printed report with four online digital videos. Each synopsizes one main attribute of the relationship of MOOCs to the digital economy:

The first summarizes what a MOOC is:

 http://edactive.ca/mooc/whatisamooc

The second summarizes what new users may need to consider for success in a MOOC:

http://edactive.ca/mooc/successinamooc

The third touches on the creation of knowledge in a MOOC:

http://edactive.ca/mooc/knowledgeinamooc

The fourth provides an example of how MOOCs might be presented as a contributor to a digital economy:

http://edactive.ca/mooc/digitaleconomysample

Collectively, the four web-based videos provide an overview of many of the points raised elsewhere in this report.

What is a MOOC?

An online phenomenon gathering momentum over the past two years or so, a MOOC integrates the connectivity of social networking, the facilitation of an acknowledged expert in a field of study, and a collection of freely accessible online resources. Perhaps most importantly, however, a MOOC builds on the active engagement of several hundred to several thousand "students" who self-organize their participation according to learning goals, prior knowledge and skills, and common interests. Although it may share in some of the conventions of an ordinary course, such as a predefined timeline and weekly topics for consideration, a MOOC generally carries no fees, no prerequisites other than Internet access and interest, no predefined expectations for participation, and no formal accreditation.

Word that a MOOC will be offered typically spreads through an online social network. A central web address may be used to consolidate a registration process, outline the suggested course schedule, and provide a nexus for support and communication. Apart from this, however, just about anything goes. Individuals may continue to use the central site to consolidate their partici-

pation or they may spin it off into their own blogs and develop and maintain ties through other technologies such as Twitter. They negotiate and define collaborative topics, working networks, and goals with others who share common interests and concerns. The results of a MOOC collaboration may extend far beyond the MOOC itself: the network negotiated is just as important as the topic covered, if not more so. Participation in a MOOC is emergent, fragmented, diffuse, and diverse. It can be frustrating. It's not unlike life.

MOOCs, the Digital Economy and Participatory Citizenship

Whereas the capacity to grow and distribute food defined the agrarian economy, and the capacity to manufacture and distribute goods defined the industrial economy, the capacity to create and apply knowledge defines the post-industrial digital economy. In this context, sustainable prosperity depends on a society's capacity to create and apply knowledge to solve problems. While digital technologies have exponentially increased the rate at which knowledge is created and distributed, they have simultaneously reduced the barriers to creating and consuming it. Not simply a bigger, faster version of industrial capitalism, this post-industrial, "fast capitalism" is replacing traditional hierarchical structures of command and control with pedagogical relationships of mentoring, training and the learning organization (Cope & Kalantzis, 2000, p. 11). In answer to the questions of the knowledge, skills and attitudes individuals need to thrive in this economy, and how they may be developed, the MOOC model serves as an ecosystem for exploring both.

The MOOC is open and invitational. No one who wishes to participate is excluded; people negotiate the extent and nature of their participation according to their individual needs and wishes, regardless of whether those needs are defined, for example, by personal interest or workplace requirements. From a theoretical perspective, this creates a very broad form of "legitimate pe-

ripheral participation" (Wenger, 1991) which allows individuals to be drawn into the community of practice at whatever rate is comfortable. From a pragmatic perspective, this framework provides access to large numbers of people who might otherwise be excluded for reasons ranging from time, to geographic location, to formal prerequisites, to financial hardship.

The large scale of the community, from several hundred to several thousand participants, maximizes the possibility that the "long tail" effect will enable someone with even the most esoteric interests within the overall focus of the MOOC to find people with whom to share and collaborate. It means also that the specific expertise of the facilitator can reach the maximum possible number of people interested in accessing that expertise. Finally, the heterogeneity of the student body, with its wide range of knowledge and skills, means that the facilitator will not have to commit to the impossible task of responding individually to each student's needs.

The emergent, self-defined nature of the MOOC capitalizes on the strengths that individuals bring to it in terms of their experiences, knowledge, skills with a range of collaborative software environments and perhaps most importantly, with the "soft skills" essential for successful negotiation and collaboration. In all these dimensions, successful participation in a MOOC parallels and scaffolds successful participation in the larger digital economy.

Research Gaps and Future Directions

Although there seems a significant congruence between the MOOC model as an educational phenomenon and its potential to scaffold wider participation in a digital economy, the model is so new that it has been subjected to little research. Moreover, the total number of MOOCs offered to date can be displayed on the fingers of two hands. That being said, MOOCs continue to be offered—at least three in the six months following the submission of the proposal which funded

this knowledge synthesis—and the tools and methods underlying them are continually being improved. A coherent research agenda would help assess both the overall viability of the model and the conditions under which it might achieve its potential. Specific pedagogical issues, challenges and questions include:

- the extent to which it can support deep enquiry and the creation of sophisticated knowledge;
- the breadth versus the depth of participation;
- whether and under what conditions successful participation can extend beyond those with broadband access and sophisticated social networking skills;
- identifying the processes and practices that might encourage lurkers, or "legitimate peripheral participants", to take on more active and central roles;
- the impact or value of even peripheral participation, specifically the extent to which it might contribute to participation in the digital economy in extra-MOOC practices;
- specific strategies to maximize the effective contribution of facilitators in particular and more advanced participants in general;
- the role for accreditation, if any, and how it might be implemented.

The viability of MOOCs from an economic perspective is also a challenge. Without tuition or registration fees, current and past MOOCs have often been volunteer initiatives which raise interesting questions about the nature of value in a digital economy defined by an abundance of knowledge and participants as opposed to their scarcity. Alternatively, parallels between MOOCs and commercial ventures such as the Massive Open Online Novel (http://mongoliad.com) or the "Indigo MBA" [(http://www.chapters.indigo.ca/Indigo-MBA/indigomba-giz.html)](http://www.chapters.indigo.ca/Indigo-MBA/indigomba-giz.html) argue that there may be potential for revenue generation that do not unduly compromise the free and open nature of the MOOC model. These potential models are currently being explored through a variety of partnerships, public and private, but the jury is still out.

In the Open – The MOOC model as digital practice

In May 2010, the Government of Canada released the Consultation Paper Improving Canada's Digital Advantage: Strategies for Sustainable Prosperity. In its Building Digital Skills For Tomorrow section, the paper states that, "Arguably the backbone of the digital economy is a strong, globally competitive information and communications technology sector" (p. 5). Our premise is that the digital economy is no longer the purview of the information and communications technology (ICT) sector, but rather of web-based collaborations and networks, of which Massive Open Online Courses (MOOCs) are an example. From that perspective, we present this knowledge synthesis project on the Massive Open Online Course (MOOC) model for open education, organizational collaboration, and general information sharing through networks.

Privileging the information and communications technology (ICT) sector and technologies themselves as the backbone of the digital economy reflects a lack of understanding of the personal and networked nature of social media, the dominant paradigm in digital technologies for the past 5 years. Web 2.0 capacities to connect, share, collaborate, and network have given rise to social media platforms such as Twitter, Flickr, Facebook, LinkedIn, blogs, wikis, podcasts, and countless others. These platforms, which all involve the capacity to build and leverage both financial and social capital, are a part of the digital economy and of many people's regular lives. The digital realm is no longer the sole purview of the ICT sector, an important point for Canadian decision-makers to understand. Most citizens in advanced economies are now impacted by the digital economy: "Achieving a knowledgeable Internet citizenry is unlikely to be resolved through a solely technical approach that focuses only on infrastructure without any consideration of the social processes and institutions in which people's Internet uses are embedded" (Hargittai, 2010, Introduction). As UBC's 2006 SSHRC proposal Development by Design points out, "Research on

the uses of ICTs in North American schools has yielded incontrovertible evidence that despite a massive expenditure on the provision of hardware, software, and connectivity, our capacity for educational innovation mediated by digital tools has proven resistant to development efforts" (Bryson, 2006). We believe that considering ICTs as the key to Canada's digital practices and economy is an error, given that they have been ineffective – in and of themselves – in achieving innovative, transformative goals even in supported classrooms. ICTs are a foundation for innovation, but in themselves, fail to significantly advance the capacity of a society to develop a knowledge-based economy. Successful digital learning innovations such as MOOCs, on the other hand, reflect the personal, networked, and openly collaborative practices and principles of Web 2.0. Increased understanding of the literacies needed to succeed in a MOOC may indicate possible directions for Canada toward achieving its goal of increasing digital skills and capacity among its citizens.

In a digital economy, capital lies in the capacity to leverage, connect, and promote knowledge (Lesser, 2000). The capacity for production and flow of manufactured goods defined prosperity in the industrial economy. Similarly, the capacity to create, improve, innovate with, and apply knowledge will define prosperity in a digital economy (Cormier, 2010). However, while the industrial age was defined by mega-corporations and mass production, digital tools and connectivity open up a range of new and creative knowledge possibilities for individuals and networks. This is a significant and critical research gap for Canada.

Canada has a distinct and disproportionate advantage in expertise in the burgeoning field of digital openness: Canadian researchers and practitioners in open education are respected as leading international authorities and innovators. The impact of these open practitioners is amplified by

their extensive social media networks connecting and engaging thousands of Canadians in digital skills development in ways that the ICT sector cannot achieve (McAuley, 2010).

Digital skills – and its latest incarnation, 21st century skills – are buzzwords utilized in media, public and business discourses, and government and educational documents to offer catalytic and transformative advantage to members of contemporary society. While we are deeply interested in the affordances of social media and technologies, we challenge the determinism implied in the view that technologies have some innate capacity to bestow use value. With "In the Open: The Massive Open Online Course model as digital practice", the focus is on the specifics of the skills and literacies reflected by the operations of the digital economy and social media. Essentially, open online courses assist in developing the skills of individuals to participate in a digital economy by developing skills in collaborating with others online and developing digital artifacts. Massive Open Online Courses (MOOCS) may be useful to the practical and conceptual development of the participatory practices and literacies that social media privilege. The MOOC model might play a critical role in developing Canada's national competitive advantage.

What is a MOOC?

A MOOC is an online course with the option of free and open registration, a publicly-shared curriculum, and open-ended outcomes. MOOCs integrate social networking, accessible online resources, and are facilitated by leading practitioners in the field of study. Most significantly, MOOCs build on the engagement of learners who self-organize their participation according to learning goals, prior knowledge and skills, and common interests. The term came into being in 2008, though versions of very large open online courses were in existence before that time (McAuley, 2010). MOOCs have been offered in conjunction with academic institutions and inde-

pendently by facilitators: to date, topics have remained within the E-learning and educational technologies fields. Some MOOCs have had upwards of 2000 registrants. MOOCs share in some of the conventions of an ordinary course, such as a predefined timeline and weekly topics for consideration, but generally have no fees, no prerequisites other than Internet access and interest, no predefined expectations for participation, and no formal accreditation (there are several instances of MOOCs that are affiliated with a university and provide learners the option of enrolling formally in the course and submitting assignments for marking).

News that a MOOC will be offered is typically spread through online social networks and email lists. Registration and course topics are offered through a central course site developed by facilitators: participants can use the central site to interact and discuss ideas, or may share their contributions from their own blogs and develop and maintain ties through other technologies such as Twitter. The course operates on an open and a-hierarchical invitation to participate in and scaffold activities and discussions: a true "teacher as learner as teacher" model (Siemens, 2006). Participation in a MOOC is emergent, fragmented, diffuse, and diverse. There is no credit or certificate offered for completion. Facilitators of MOOCs volunteer their time, and comment on participants' input, but it is expected that the community of participants will be the primary source of feedback for the majority of work contributed. This is in keeping with the participatory collaboration and commenting norms within social media.

Who are We?

The "In the Open" project team represents a unique combination of experiential and research expertise in the areas of online and open learning. The PI and co-applicants were all active in the 2010 Edfutures MOOC (http://edfutures.com), two as course designers and facilitators (Siemens

and Cormier) and two as participants (Stewart and McAuley): the reflections from which this narrative synthesis were drawn stem in part from that shared experience.

Three members of the team are based at the University of Prince Edward Island. The Principal Investigator of the project, Dr. Alexander (Sandy) McAuley, has worked since the late 1980s as a practitioner and researcher exploring the potential of digital networks to support knowledge creation in education at the K-12 and post-secondary level, particularly in the far north. In 2007-2008 he worked as PI with team members Dave Cormier and Bonnie Stewart on the innovative Living Archives project (http://livingarchives.ca). The Living Archives' synthesis of social net-working technologies and knowledge creation principles (Scardamalia, 2002) prefigures on a small scale some of the issues raised in this study. Co-Applicant Bonnie Stewart is a member of UPEI's inaugural PhD cohort in Educational Studies. Her work explores the mutual constitution of knowledge and technologies, epistemologies of the digital, and post-cyborg conceptions of branding and identity performance. A longtime blogger, she is particularly interested in the lived experience of immersion within social media, and the concepts of self and learner that circulate within the discourses of the digital and creative economies. Co-Applicant Dave Cormier's work focuses on the concepts of community as curriculum, the placing of educational technologies in a post-digital context, and rhizomatic models of knowledge creation. **Dave is the co-founder and current manager of Edtechtalk, a community of educators that has produced more than 1000 live interactive webcasts since June 2005.** He has been actively involved with MOOCs since the inaugural Connective (CCK08) course, and coined the term "MOOC" to represent the phenomenon. Dave has co-facilitated 2 MOOC courses to date: the spring 2010 Edfutures MOOC, and the fall 2010 Personal Learning Environments and Knowledge (PLENK2010) MOOC. Co-Applicant George Siemens of Athabasca University's TEKRI partners with UPEI on this project: author of

the book Knowing Knowledge, an exploration of the impact of the changed context and characteristics of knowledge in digital society, George is an influential theorist of digital knowledge with an international reputation. He, with Stephen Downes of the NRC in Moncton, New Brunswick, is at the forefront of developing MOOCs, and has been actively involved in all that have been offered.

Together, this team represents a collaboration of academic and social media expertise on the digital. Dave and George are among five educators in the world leading exploration of the possibilities of MOOCs. The four members have over 10 000 combined followers on Twitter, and are all leaders within their own digital spheres. It is from this perspective of embedded participants in the highly participatory environment that is digital media that they offer their knowledge regarding digital skills development and the Massive Open Online Course (MOOC) model.

Narrative Introductions:

Dave Cormier

I have a vested interest, maybe, in the idea of MOOCs working. There are number of the facets presented by the concept that directly relate to the research and writing that I have been doing for the past 5 years. My research interests explore how the negotiation of knowledge among peer groups can be leveraged as a learning ecology. I am also interested in how open networked learn-

ing models can support long term connectivity between peers to provide an extended impact on how learning can happen for an individual. The MOOC speaks to both of these interests.

I started my journey into open education when I co-founded Edtechtalk.com in June of 2005. Edtechtalk was the name of the first live, interactive podcast that I produced with my colleague Jeff Lebow. It is also the name of the website that hosts the podcasts, and the community of educators that grew out of those first meetings. The initial vision for live webcasts were to start an ongoing discussion between educators, to share our knowledge and develop a shared understanding of to improve our own practice. This idea of creating a space for conversation, for workshops and collaboration were critical to the work we planned to do. The result of this has been 1200+ live interactive webcasts since that first episode in 2005 and countless connections made.

After those first few months of webcasting, we began to receive inquiries from others who wanted to host their own webcast on what was quickly becoming a network of live discussions. Not having the free time to personally train each of the people interested in doing these shows, we established the 'webcast academy' http://webcastacademy.net/ which we saw as a collaborative, community course that could provide training and support for the new groups of webcasters wishing to join the community. One could say that "the community was the curriculum."

My introduction to MOOCs came in the summer of 2008 when I was preparing to host a series of two discussions on Edtechtalk covering this emerging phenomenon called CCK08. It was an open course on connectivism, a relatively esoteric topic in educational theory, that was being offered to whomever wished to register for free. At that time there were hundreds of people registered and in hosting discussions with the course facilitators Stephen Downes and George Siemens we

started to ask questions about what it could mean to have thousands of people talking about the same topic on the open web.

I was fascinated by the enthusiasm that seemed to be generated by the event of the course itself. The challenge that we had had in trying to build on the success of edtechtalk, was that it was difficult to replicate. It was also very difficult to scale. Something about the fact that the MOOC was being offered at a given time, along a certain set of topics, took the ideas that developed out of the work with edtechtalk and brought them to a different group of people in a more focused way. This feeling was reinforced by the finding of the openhabitat project, which suggested that 'eventedness' was a key factor in participation in any online educational endeavour. (Cormier, 2009)

I co-facilitated one of the live, collaborative sessions for CCK08, and found the ever changing dynamics of those sessions both familiar from my time with edtechtalk, and challenging to my instincts as an educator. In any given live session, you might get a combination of people who had not seen any of the materials for a given week, some who were visiting for the first time and others who had been following along with the course quite passionately. There were participants who had things to say with respect to the material of the course, others had input on the format and still more on the value of the topic itself. The authenticity of this, the way in which this transcends the artificial contexts of a traditional course, are one of my key interests in openness.

I have since been involved in co-facilitating two more MOOCs, edfutures and #PLENK10. The live, collaborative process of a MOOC is one that fits in very nicely with my comfort zone in relation to the web. They are, in a sense, a direct extension of the work that I started with during edtechtalk. My other comfortable method of interaction are in the form of weekly reflections on the

work that is being done by participants as it reflects my own feelings on the topic and the materials for that week. I am less comfortable with the role of 'maintaining' a discussion amongst participants. I tend to feel that any interference in the interaction between students creates a hierarchy of discussion that impedes the creation of network clusters. This tension between facilitating specific discussions and the more indirect process of attempting to support an ecology for learning, is still unresolved.

The network cluster, in the end, is where my main interest lies in the MOOC. Is there a point at which learners select another set of learners with whom they can negotiate solutions/knowledge that will allow them to achieve their goals? Is the resistance that is present for some learners a question of the habit formed in traditional education or does it reflect a more deep seated difference? Goals can be as diverse as the learners themselves, but the possibility of supporting the creation of long term clusters rewards the effort of putting on the event. People meet the people they need to meet. They find the solutions they were hoping to find. They also, hopefully, find a sense of community, which may be reason enough to do it by itself.

Bonnie Stewart

In spring 2010, I was a participant in the open online course on Edfutures offered by George Siemens of Athabasca and Dave Cormier of UPEI.

I joined the course because I had recently been accepted into the inaugural Ph.D in Educational Studies program at the University of Prince Edward Island, and after almost a decade spent in higher education but larger outside of formal academic studies, I wanted to begin to reshape my life around formal learning practices once again. Additionally, my area of interest for my doctoral studies is the epistemology and discourse of social media, so I hoped that the concepts underpin-

ning futures work might be useful and interesting for me to explore. Ultimately, as a long-time user and student of social media, I was curious about the MOOC model itself and what the experience of participating in one might be like.

I was drawn to the flexibility of the MOOC because, with a full-time job and a number of writing commitments on my plate, the open-ended commitment of this type of learning appealed to me far more than a formal course would have at that particular time. The fact that it was free was likewise appealing, but not nearly as significant to me as the different social contract involved: the informality of the commitment to the MOOC meant I felt free to participate more on my own terms than I would have in a traditional course. I saw the opportunity as a step towards re-entry into formal education but without the same external obligations, and as a chance to enjoy a learning opportunity entirely focused on intrinsic rather than extrinsic motivations.

Being comfortable with the practices of social media was very helpful for me in terms of making sense of the course: I've been blogging a long time and therefore it felt natural for me to put comments and ideas out there – even if only in partially-baked, not-quite-ready-for-prime time publication form - for others to interact with. I didn't blog my course responses, however; my blog has an established audience, and I felt that leaping into an entirely new and highly contextual conversation wouldn't work with my readership and reputation in that space. So, for me, the course site and discussion boards and other people's blog posts were where I did my working out of ideas. I posted to the wiki and used different areas of the main course site: it was a much more diffuse kind of conversation than I'm accustomed to holding on the Internet, because the majority of the people I engaged with were new contacts for me. Some responded and we gradually built ties based on collaboration with each others' ideas. For the most part, however, my participation was minimal: I read, and tried to get a sense of how the structure of the MOOC and the conversa-

tion were unfolding. And the freedom to do that in a course environment – to be an engaged observer – was meaningful for me. I learned as much about MOOCs themselves and thought as much about what it means to learn and to teach as I did about the actual topic of educational futures.

Certainly, the content and structure of the Edfutures MOOC privileged learners who came in expecting a relatively loosely organized and direct engagement with ideas, in keeping with the open opportunities for registration and the open attitude towards content and knowledge-making. I did go in expecting that, and was mostly able to make sense of the experience. What I hadn't prepared myself for was my response to it: I have been both a teacher and student in other online learning initiatives, but most followed some set path, and this was my first time truly learning with others for myself. A part of me kept feeling I was missing something that I ought to be doing, if not directly for the instructors then in terms of the social contract I'd engaged in with my fellow students. I worried that being only partly present, while true to my own learning goals for the course, minimized my effectiveness as a community member within the learning cohort. If I were to do another MOOC, I'd think I'd be better prepared the second round to manage my expectations of myself in relation to those social and community aspects of the course.

The other aspect of the course that challenged me was remaining engaged during periods where my knowledge was minimal. While I was comfortable contributing my ideas in the diffuse environment of the MOOC when I felt I had something to offer the distributed nature of the course became difficult for me when we ventured into topics which were content-heavy and unfamiliar to me. I suspect I was not alone: there was a period in the Edfutures MOOC when learner contributions became quite thin, and discussion in Elluminate suggested that many of us were feeling out of our element in this particular discussion and thus remaining relatively silent. It was, for

me, the point of the course at which I largely disengaged: the momentum I'd been building slipped, and once one pulls back, it is harder to start again. I had been participating from the position of a person with both something to contribute and something to learn. Once I felt I didn't have much to offer, I had trouble maintaining my sense of my role.

Extrapolating, I'd venture that one of the implicit limitations on participation in MOOCs may be that sense of learner identity. People not only need to be comfortable in the prosumer role of creator and consumer of knowledge content, but they need to be able to maintain an identity from which they can speak even when their actual knowledge is minimal. Our educational culture does not prepare people for the experience of acting as a knowledge-builder in this type of inquiry situation. In a large enough group, there might be enough variance in learner knowledge that the overall drop in participation doesn't occur, but it would be wise for MOOC facilitators to consider strategies for scaffolding or sustaining participation through content-heavy or less-personalized topics.

My own role in the Edfutures MOOC was particularly unusual in that Dave, my co-researcher here and one of the instructors of the course, is my partner. As a result, I had a bird's-eye-view of the course management and strategy, and also of the experience and intentions of the instructional team. I also had the privilege of something of an insider position in what was very much a relational course, wherein I went in knowing the instructors well enough to engage and banter from the beginning.

However, being a family member of an instructor creates constraints and issues, even in a non-graded, non-credit course situation: offering the same comment and critique of the course as I would have had I not been affiliated with Dave was not really possible. It was not communica-

tions with him that were the issue, but the fact that in a participatory environment all relations are part of a social contract. The social contract of being learners together becomes fraught whenever there is conflict or silence, and these were the places where my position as "the instructor's wife" went against my instincts to mobilize inquiry and resolution.

Towards the late middle of the course, during the 5th and 6th weeks, there was a slump period where participation was slim except for a few voices of critique. I wanted to engage in the critique but felt too positioned to have my input taken as anything other than PR, either by other students or by Dave & George. I did speak frankly with Dave at home about my own perceptions of where people had dropped off and why: this was a privileged position to to speak from, certainly, but also a challenging one. In some ways the distance of depersonalized public reflection and critique creates far less tension than direct criticism. I likewise felt disingenuous taking on any position of positive reflection in the course site, for fear of being perceived or dismissed by other students simply as a booster or blind supporter. I was afraid of being perceived as overstepping my role, or being aligned in ways that might make others uncomfortable.

Complicating things further, one of the voices of critique was Sandy's, our Principal Investigator and also my supervisor for my Ph.D research. It was interesting, from my perspective, for he and I to have the opportunity to be students together. The shift of roles was neither difficult nor uncomfortable: we offered each other a known node to interact with on Elluminate and in the course site, but beyond that, our collaborations were minimal. However, had Dave and I not been a couple, I would have felt more free to engage with Sandy's critique of the course using the course site itself. Instead, what response I gave him was given behind the scenes: negotiating a voice in the midst of that web of power relations was far harder for me to undertake online, where I risked being observed, misunderstood, or taken up as currying favour with one or the

other. Ultimately, these personal relationships shaped my public performance as a learner in the MOOC more than I would have anticipated. What this reflects about my own tendencies and about power relations in general, I am not entirely sure. I do know that while MOOCs are in some ways more democratic social contracts than traditional teacher-learner classroom roles, they are still negotiations of power in which people establish the right to speak and be heard based on relational roles. My role, admittedly, was unusual, and not a situation most MOOC participants will need to negotiate.

Overall, my sense is that it is the relational and role-based aspects of the MOOC that are perhaps the greatest departure and adjustment for course participants. Schooling trains us, even in spite of progressive pedagogies, towards a relational status quo where power and knowledge still inhere in the role of teacher. The MOOC model represents a different engagement that reflects the norms of digital interactions and social media culture far more than traditional education. This reality ends up offering an extraordinary meta-learning opportunity for participants, but is also somewhat challenging even for people accustomed to and adept in the relational negotiations of digital culture.

George Siemens

My interest in MOOCs is largely based in my experience in online interactions. In 2000, while at Red River College in Winnipeg, Manitoba, I started blogging in order to share my experience with educational technology. At the time, educational technology was largely a peripheral topic in most higher education institutions. I found it difficult to connect with colleagues within RRC as my interest in connecting tools of personal control (blogs and later wikis) with participatory pedagogy did not resonate with many others in the college. Through blogging, however, I was

able to connect with like-minded educators who were in a position similar to mine: eager to explore how technology could alter teaching and learning, but not finding enough colleagues within their institution to advance the discussion.

I set up a website (elearnspace.org) and started publishing a weekly newsletter on education, technology, and knowledge trends (the newsletter current has about 7 000 subscribers). Over time, I developed what would now be called a "personal learning network", including people like Dave Cormier, Alec Couros, Stephen Downes, Will Richardson, Jane Knight, Josie Fraser, and others. Participant in my learning network had an intense intellectual curiosity and desire to share her/his thoughts and ideas. Together with Stephen Downes, I founded a site focused on open education (open-education.org, a site that is no longer active). We started to look at how openness of content and social interactions could change how a society learns. Unfortunately, the low levels of adoption in web 2.0 and social media in 2002 made it difficult to realize the vision of scaling the social dimension of learning to a sufficient level to take advantage of network effects. During this time, in numerous interactions with Dave Cormier, including several appearances on EdTechTalk, along with other bloggers with higher education affiliation, I started moving greater portions of my teaching and learning activities online.

A few initial experiments in large-scale online interaction - the Online Connectivism Conference 2007 and the Future of Education Conference 2007 (both at University of Manitoba) - provided me with a better understanding of how and why people participate in online learning activities. In particular, I became aware of the need for learning activities to include both synchronous and asynchronous components, as learners from around the world were participating in the conferences. In spring of 2008, I approached Stephen Downes to see if he was interested in co-facilitating a course on connectivism. Both Stephen and I had written extensively about the dis-

tributed nature of knowledge and the growing prominence of networked learning. We felt that a

course that embodied connectivism would be the best way to communicate connectivism as a

learning and knowledge theory. We approached Dave Cormier to assist in running the course and

contributing to the weekly live sessions and debates. Dave, Stephen, and I initiated a few online

sessions in August, 2008 to discuss the successes and failures of other open learning initiatives.

Based on this discussion, we settled on the pedagogical model that continues to define MOOCs:

- High levels of learner control over modes and places of interaction
- Weekly synchronous sessions with facilitators and guest speakers
- The Daily email newsletter as a regular contact point for course participants. The Daily includes a summary of Moodle forums, course participant blogs, Twitter discussions related to the course, etc.
- Using RSS-harvesting (gRSShopper) to track blogs of course participants
- Emphasis on learner autonomy in selecting learning resources and level of participation in activities
- Emphasis on social systems as effective means for learners to self-organize and wayfinding through complex subject areas
- The criticality of "creation" - i.e. learners create and share their understanding of the course topics through blogs, concept maps, videos, images, and podcasts. Creating a digital artifact helps learners to re-centre the course discussion to a more personal basis.

The success of our first course - CCK08 - was not anticipated. We found quickly that the course

took a life of its own as participants created Second Life meeting areas, Google groups to discuss

certain topic areas, study groups for people in similar locations, Facebook groups, and so on. Ad-

ditionally, the course syllabus was translated into at least five different languages as participants

from dozens of countries around the world joined. Our decision to open the course unleashed a

level of creativity unlike anything I had encountered in my previous teaching. I had to let go of

many of my assumptions about what I needed to do as an educator and what I expected of

course participants. Numerous technical details needed to be addressed as well: it's very easy to

fragment content and conversations, the key challenge was, and continues to be, finding a way to

connect the fragmented pieces in such a way as to provide learners with a sense of knowledge

coherence. While we experimented with different technical approaches (such as using Downes' gRSShopper to aggregate blogs, encourage participants to track the course tag on Google Alerts, use of the Daily newsletter to provide a reasonably consistent summary of course activity), the social interactions of learners in the course provided the most sensemaking approach for most participants. The formation of sub-networks for discussion and collaboration helped to cluster the conversation around themes and topics relevant to individual participants. Several research papers, written by participants who first met in CCK08, have been produced over the last several years.

Since CCK08, I have been involved with various other open courses. In the process, I'm beginning to see a few consistent patterns that emerge as the courses progress. The patterns of participation (generally high early in the course, with the development of sub-networks, and gradual tapering of activity) present a research agenda that may provide critical insight into how teaching and learning should be conducted online, regardless of number of participants. The tools and methods to run a MOOC are still in their infancy, but are improving with each course we run. Similarly, we are refining our pedagogical approach and getting a better sense of when instructors should be most active. We're also starting to understand the power and control relationship in a MOOC - participants are quite vocal when they perceive that instructors are violating the spirit of open courses. As instructors we have to be aware of these expectations - an open course relies on the effort and participation of many.

Many, many questions remain about the learner experience, how the technical components of MOOCs can be made to be more accessible to other educators, how different disciplines react to MOOCs, and so on. However, at this stage, it has become quite clear to me that understanding how social interactions in networks scale is critical to understanding the future of education.

Gutenberg permitted content to scale. Today's web permits social interactions to scale. I can think of very few areas of research that will have a more dramatic impact on education in the next decade.

Sandy McAuley

I should say at the outset that I'm coming to this project as a bit of a relic, possibly even a fossil. In terms of Prensky's (2009) overused distinction, I'm situated firmly as a digital immigrant.

Perhaps a peculiar sort of digital immigrant, though. Although I was born in the 1950s, long before the digital revolution, I've been active with teaching and learning on digital networks since the late 1980s. I was an early member of the Apple Global Education (AGE) Network in 1989. In 1991 a colleague and I launched Takujaksat, an easy-to-use FirstClass® electronic BBS with a graphical interface that linked all schools in the Baffin region of the eastern arctic. Takujaksat was later gatewayed to the Internet, thus bringing the first Internet connections to eastern arctic schools. I was also an active member (and president for a while) of NT*Net, a CANARIE-funded non-profit organization that brought Internet access to Yellowknife and then, in 1996, to Iqaluit. Along the way I have supported, promoted, and worked with a fair number of educational networking projects.

Probably the most significant event in this process of digital immigration was an article I read in MacWorld in 1990 which described the CSILE (Computer Supported Intentional Learning Environment) project at OISE/UT in Toronto. Running on a LAN, CSILE was a multimedia discourse environment which supported collaborative investigations by means of student-created hyperlinked notes. Even restricted to a LAN, it seemed to me a powerful means to develop the online collaborative skills that learners would find essential to make use of the computer-based learning

networks presaged by the AGE. I also appreciated its open nature, specifically its emphasis on learner-generated questions and absence of prescriptive, algorithmic approaches to problem-solving and learning. Between 1992 and 2000, with the involvement of many teachers and several schools in the arctic, the Baffin Divisional Board of Education, the Government of the Northwest Territories, Apple Canada, and the Institute of Knowledge Innovation and Technology at OISE/UT, I helped coordinate a number of projects which saw CSILE used to support collaborative learning. A number of these experiences became the basis of my EdD dissertation, completed in 2004.

Between 1992 and the present, CSILE evolved into MacCSILE, then Knowledge Forum. It became one of the keystone technologies of the Telelearning National Centres of Excellence and grew to embrace many emerging Internet standards. At a deeper conceptual and epistemological level, however, its evolution reflected a growing emphasis on supporting collaborative knowledge creation as opposed to individual, intentional learning. Although programs such as CMAP allow for the collaborative creation of concept maps, CSILE/Knowledge Forum remains one of a few digital environments, if not the only one, that supports collaborative knowledge construction by means of movable, user-created digital objects in a two-dimensional space: text has meaning; images, graphics and multimedia have meaning; and that meaning can be augmented by spatial relationships. Work continues to explore the roles of animation and three-dimensional space as means to understand the processes by which knowledge is created in an online environment, and how they can be supported and improved.

My involvement with CSILE/Knowledge Forum and the knowledge building paradigm underneath it may have blinded me to the explosion of Web 2.0. For example, when I first heard of wikis in 2001, I was unimpressed—they seemed little different from a group note in Knowledge

Forum. Similarly, blogs seemed little more than public versions of a Knowledge Forum notes. The triviality of many blogs, the fact that many were started, but few sustained recalled to me the low "signal-to-noise" ratio that plagued many knowledge building discussions, especially the less successful ones. Further, as a relatively long-term K-12 educator I was skeptical of the hyperbolic language about how blogs, wikis, and podcasts were going to revolutionize education. Better tools had preceded these with little impact—how were these different? I was irritated that very few of the evangelists of these new technologies seemed to have much awareness, let alone understanding, about the work on online educational learning that had preceded them.

My bias against Web 2.0 technologies overlooked two major points. First, starting from about the time we first provided local dialup Internet access in 1996 and fuelled by the accessibility and utility of web browsers with graphical interfaces, the Internet became a socio-technical phenomenon of unprecedented scope. It didn't matter that many, if not most blogs were trivial, unread, or dead, the scope was such that there were still massive numbers—far more than schools using Knowledge Forum, for example—that were useful and interesting. Second, technologies such as RSS made finding those blogs and keeping track of their updates at least somewhat manageable. It became possible to conceive of the open Internet as a viable alternative to the password-protected walled garden of Knowledge Forum. Despite this possibility, the social and pedagogical structures that could transform the massive open potential of the Internet to viable learning experiences on a similarly massive scale were lacking.

My involvement in the EdFutures MOOC was therefore multidimensional. As a teacher and teacher educator I am aware that instruction requires both content and pedagogical knowledge. As a developer and instructor of online courses, I understand that the online environment both extends and constrains effective face-to-face pedagogies. As an educational researcher who has

been working with a focus on the potential of networked environments to support individuals'
and groups' critical and creative capacities to construct knowledge in a world in which those ca-
pacities are essential components of well-being, I am interested both in how education needs to
change and the forces that facilitate or impair the change process. I came to the MOOC on Educa-
tional Futures as an educator interested in the processes through which deeper understandings of
the future of education could be built and as a hopeful skeptic about the MOOC as an emergent
way to structure this.

Methodology

This project is a narrative inquiry into the practices of the digital economy, and the con-
cepts of learning and knowledge represented by these practices. It is also an exploration of the
ways MOOCs reflect these digital practices, of the economic and educational potential of MOOCs
for Canadians, and of the literacies and skills both taught and required within MOOC environ-
ments.

Our synthesis, then, is a shared reflection on the project's research questions. Each of us
wrote extensive responses to the questions, based both on personal research and on our experi-
ences with MOOCs and with digital media in general. These responses were then explored and
discussed among the group, with common themes pulled out and points added where team
members felt salient ideas were missing. Our narratives emphasized our understandings of digi-
tal embeddedness, digital literacies, and the operations of the digital economy in broad strokes.
These are for the most part less personal stories than syntheses of observations based on research
and long-term work within digital culture. Throughout much of the synthesis, our commonalities

were strong enough that we chose to collapse our voices into one: a single synthesized story of MOOCs and their relevance to the digital economy.

However, because we each spoke in part from the basis of experience, there were elements of the project where synthesis into a single voice was neither possible nor desirable. In those places, we have chosen to emphasize the individual, contextual knowledge of our narratives, as stories that supply the basis for interpretation (Bruner, 1991). In articulating common practices without generalizing or theming individual stories into a monolithic account of digital self-hood, we hope that a broad picture of the experience of digital immersion and MOOCs specifically will emerge.

During our research, we also used our individual responses to the questions to inform the development of four short video scripts on MOOCs, to be distributed online. The process of combing through our many pages of ideas and distilling them down to a few key points was powerful, and informed the structure and shape of the synthesis itself.

The Research Questions:

Question Strand 1. How do MOOCs reflect effective practices within the digital economy? What are their implications for knowledge-making and what it means to know today? What economic opportunities and challenges does the open model of participation bring into focus?

Question Strand 2. In terms of discourses, literacies, and prior knowledge, what digital skills are privileged and rewarded within the MOOC environment? What factors limit participation? How can the MOOC model help engage and develop an effective digital citizenry?

1. How do MOOCS reflect effective practices within the digital economy?

Economy in a Digital Age

Wikipedia defines a digital economy as "an economy that is based on electronic goods and services produced by an electronic business and traded through electronic commerce" ("Digital Economy," 2010). While Wikipedia is still frequently challenged in contemporary culture as a source of reliable information, it is interesting to note that its definition closely parallels the emphasis on marketplace, goods and services, and transactions that Improving Canada's Digital Advantage: Strategies for Sustainable Prosperity, the Government of Canada's Consultation Paper on a Digital Economy Strategy for Canada evidences on its landing page (http://de-en.gc.ca/consultation-paper/consultation-paper-6/). It is our premise, however, that the digital economy is more than just the traditional goods and service economy translated to a virtual environment. We urge Canadian policymakers to consider a broader, more dynamic and open-ended framework which integrates and capitalizes on the digital innovation, practices, and skills emerging from the explosive growth of social media. Just as "economy" and "ecology" share the same etymological root in the wider context (Jacobs, 2000), so should discussion of the digital economy consider seriously its relationship to the wider digital ecology.

In this broader view, all human social interactions occur within some sort of economy, the rules governing exchange. All economic activity is at its core a knowledge activity (Sakaiya,

1991). Economic systems seek to provide valuation of an entity (physical or otherwise) and then to provide a mechanism for ongoing value negotiation and exchange (traditionally a marketplace, more recently the stock market). Historically, eras have different entities underlying the valuation process: gold, wheat, coal, and oil are all historical examples. In each instance, however, knowledge is the central entity in the process even when its presence is obscured by a focus on commodities or physical objects.

Past systems have raised the bar for participation in knowledge-making arenas in order to preserve both the integrity of the knowledge itself and the privilege of those already inculcated into the system: guilds in medieval Europe are an illustration of this form of control. At their peak, guilds were powerful and positive protectionist systems for those on the inside, but very limiting in terms of access to those on the outside, thus restricting social mobility for individuals as well as controlling knowledge. In more recent times, information systems – news, media, and academia, in their different ways – have operated as guild-like barriers to newcomers by leveraging high capital costs for participation in the knowledge-making industries.

A key difference between the digital economy and the traditional in terms of knowledge-use and knowledge-production is the barrier-reducing impact of the Internet. Access to the means of production is relatively open and individualized, though realities of technology ownership, broadband Internet access, literacy (digital and otherwise), and capacity to speak in the languages and discourses that carry capital all place limits on who has voice online. Nonetheless, for a significant portion of the human population, the Internet offers at least some means to bypass the boundaries, including costs, of traditional gatekeeping systems of knowledge-making and knowledge dissemination. In effect, digital technologies make the capacities for duplication and dissemination available to an individual rather than an institution or system.

The digital economy has also long been touted as a knowledge economy, or more recently as a creative economy (Howkins, 2001, Florida, 2002). Whatever its label, our current societal economic structure breaks entrepreneurship out of its business origins (Brown, 2010), emphasizing ahierarchical and distributed peer-to-peer production, and continual innovation. The digital economy is participatory, and it is participation that MOOCs enable on a grand scale.

MOOCS and Fast Capital

MOOCs would not have made sense in a traditional industrial economy, even had the technologies to facilitate them existed. MOOCs reflect essential features of the "fast capitalism" of post-industrial workplaces and society in which "traditional structures of command and control are being replaced by relationships of pedagogy: mentoring, training, and the learning organization" (Cope and Kalantzis, 2000). Digital and creative economies operate on change and destabilization, which forces participants within those economies to become, in effect, lifelong learners. This creates both opportunities and stresses for individuals, and a distinct chasm between the literacies emphasized in public discourse about our increasingly retro-industrial school system and the participatory practices of digital knowing and being. Simple binary narratives about one model being forward-looking and the other backward, however, do not do justice to either. MOOCs exist in a contested cultural space in which business interests infiltrate the web as much as the standardized-skills lobby, and the participatory and even democratic features of social media behaviours within fast capitalism are nonetheless tied to the movement of capital, both social and financial. Even though MOOCs are free and open and grounded in the tradition of the open-source movement, they serve an economic purpose. As the cultural opposition between the Protestant work ethic and the bohemian artistic ethic is conflated (de la Fuente, 2010) in figures like

the pop-culture geek hero (Florida, 2002), MOOCs offer opportunities for development of relevant digital economy literacies in a fast capital mentored-learning environment.

MOOCS as Digital Practice

In a sense, MOOCs embody rather than reflect practices within the digital economy. MOOCs reduce barriers to information access and to the dialogue that permits individuals and society to grow knowledge. Much of the technical innovation in the last several centuries has permitted humanity to extend itself physically and conceptually, via the use of telescopes, trains, cars, and airplanes. The Internet, especially in recent developments of connective and collaborative applications, is a cognitive extension for humanity. Put another way, the Internet offers a model where the production and reproduction of knowledge is separated from physical objects. For example, even though the knowledge embodied in the creation of a second tractor is no more than that required to create the first, the material requirements are double: it's not the knowledge that is the barrier, but the physical resources. Restrictions to duplication rest primarily in the physical embodiment of knowledge. On the other hand, digital information is nearly frictionless as costs for labour and material are reduced to virtually nothing. Our cultural concept of intellectual property comes from a world in which information and authorship were seen as creating new things, in an environment where copies involved labour and investment (Spender, 1995; Shirky, 2010). The overt sharing of course materials, ideas, and knowledge-building processes is growing in popularity, as evidenced by MIT's OpenCourseWare initiative. Its Return on Investment (ROI) is to bind learners to the MIT brand rather than charge them for educational experience. In a reputational economy built on post-scarcity, value lies in the synthesis, presentation and application of ideas rather than their possession.

But MOOCs also embody the digital economy in terms of their reputational, relational, and networked operations, which are the same as those of social media itself. The digital economy is in part a reputational economy, one in which social capital shares precedence with actual monetary value. Reputational capital is a fragile asset that centres around the concept of belonging, which takes time to build but can be easily damaged (Hall, 1993, p. 608). Reputation and belonging determine the scale of attention or clout an entity can command; this scale is represented by audience, number of followers, and amplification of one's contributions. Traditional credentials can be part of the way a person establishes authority within social media, but authority is primarily performative, and so established credentials generally will not garner the same attention, capital, or amplification as outside the digital economy unless they are combined with overt demonstration of knowledge or skill, and also with connection to others.

The relational – or network – aspects of the digital economy rest on these points of connection between people. The digital economy relies not just upon the formal infrastructure and services identified in the government's Consultation Paper, but on open, global networks of people whose connections carry capital exchange potential, whether of direct goods and services, information, simple friendship, or knowledge-building opportunities. It is a common practice in the digital economy for different groups and companies to band together to find collaborative ways to achieve goals, as evidenced by the early success of open source movements, and more recently by more commercial endeavours such as blog conglomerates. The potential increase of reach for the products or services of a given company are expanded exponentially with the inclusion of an effective working network.

Networks are the structures through which knowledge is created, shared, and improved during a MOOC, particularly by participants. Learners are encouraged to represent their learning and

their questions through whatever multiplicity of platforms suits their preference, to share their work not just with the facilitators but with each other, and to connect to each other around issues and topics of shared interest. In these ways, MOOCs model and build capacity for collaborative networks of unprecedented size that transcend time and space. Additionally, the network ties created between people during a MOOC – because they are based on intrinsic interests and on longterm personal platforms rather than confined solely to course topics or to a course content management system – have the potential to continue as sustainable and relevant personal and professional connections beyond the boundaries of the course itself. Through the MOOC experience, both Dave and George, who have been involved with MOOCs from the beginning, have built significant professional and in some cases personal connections with a wide range of people.

The experience of negotiating knowledge in a network, among a large group of people with potentially divergent or even contradictory results, is one of the digital literacies that a MOOC makes available to learners. The flexibility required in collaboration is itself valuable within the digital economy, as the digital emphasis on innovation and participation makes lifelong learning an implicit societal expectation (Lundvall, Rasmussen, & Lorenz, 2010). Being able to perform identity and build reputation online, and develop relationships and networks among distributed peers is a key requirement for success in the digital economy.

MOOCs are open and fluid, each key factors in epistemological digital practices. In this they differ from traditional practices and pedagogies transferred to an online environment. They are also iterative and nimble systems. The digital is not circumscribed by space constraints, or by resource availability so long as broadband internet is in place: the CCK08 MOOC had over 2000 people register to participate. In a MOOC, there is no reason to close class registration at 30 or 300 or

whatever number a given classroom space will hold. The constraining factors of traditional academic learning models are not always evident in online environments.

However, this potential for open registration in terms of space creates challenges for instructors and students alike in terms of expectations: conventions of role and interactions in a "classroom" context are deeply ingrained, and when the shatters the scale of classroom relationships, the concept of what it means to be a class need to be re-evaluated and possibly reconstructed by participants within the MOOC.

This holds true for the openness of criteria for participation: the credentialism which tends to limit participation or set prerequisites around it is difficult to sustain in a MOOC because there is no centralized organizational structure and no agreed-upon system or set of credentials accepted. In the digital, people are often able to gain recognition for achievements through reputational media that might not meet the external standards of governing bodies in similar fields: amplification operates to create recognition. MOOCs have not – to this point – offered an external credential upon completion: because the digital is a reputational economy, the experience of participation allows a learner to build value and credibility within the network through performance. However, again, the concept of what it means to take a course is challenged by the lack of extrinsic assessment or "piece of paper." While MOOCs remain experimental offerings populated by digital enthusiasts, this has been accepted by participants, though models of credential have been proposed. As MOOCs begin to command the interest of policy-makers and business, it is expected that this conversation will have to be revisited.

MOOCs and Learner Roles

Because MOOCs are open to anyone who is interested, whether they have the academic or experiential background to contextualize the material explored, the filtering of participants happens after the course starts, rather than before. Both Dave and George have noted that this seems to lead to higher drop/attrition rates than would generally be seen: the fact that the courses are free is likely also a contributing factor, as people are not required to make a extensive financial commitment before embarking. Fini (2009) surveyed CCK08 participants, and of 83 responses found that only 15 had completed all course requirements. At the same time, MOOC facilitators report that many non-completing learners from early MOOCs continue to register, and participate in, new offerings. It is assumed within the MOOC environment that completion of all course assignments is neither necessary nor the goal of every student.

MOOCs also flatten hierarchy by allowing and forcing personal connection across the boundaries between teachers and learners in traditional academic and professional circles. The devolution from instructors to learners of a significant proportion of responsibility for learning goals and the processes through which goals are achieved is a basic premise of a MOOC: the courses emphasize shared responsibility for direction. This democratization only goes so far, however: both anecdotal evidence and Fini's (2009) study suggest that some learners find the experience of a MOOC confusing, in relation to expectations of a course model environment. Both Sandy and Bonnie, who registered as learners in the Edfutures 2010 MOOC, were at times challenged by the role. Bonnie found particularly that her frustration increased in inverse relation to her comfort and confidence with the topics being discussed: the less she knew, the more she struggled to independently organize her learning and a place from which to contribute.

2. The implications of MOOCs for knowledge-making and what it means to know within the digital economy

The implications of MOOCs for knowledge-making and what it means to know within the digital economy beg two central questions. First, how does the digital economy change knowing and knowledge-making and, second, to what extent are MOOCs better suited to preparing a digital citizenry for these changes than the more conventional educational alternatives?

Knowing and knowledge-making in the digital economy

It may help to frame the impact of the digital economy on knowing and knowledge-making within the traditional binary of "knowing that" and "knowing how". Making knowledge requires deep understanding both of the field(s) within which knowledge is to be created and applied (knowledge that) and the critical and creative processes through which knowledge is created (knowing how). Digital technologies have affected the former largely in terms of the exponentially higher speed with which knowledge is created and the resulting volume. The situation is further complicated by the delay between the creation of knowledge and its dissemination through reliable channels such as peer-reviewed journals. In this context it becomes extremely difficult, if not virtually impossible, for an individual to maintain currency with the state of the art in a particular field.

Although Web 3.0 technologies are expected to help individuals sort through the volume of new knowledge, they depend on the availability of knowledge in a format that they can process. MOOCs, on the other hand, tap into social networks of personal knowledge. Even if no individual can maintain currency with the entirety of a field of knowledge, a sufficiently large group of people can do so collectively. "Knowing that" in this context includes a process of "knowing

how" to create and maintain a network of people that can be tapped when needed to contribute to address a knowledge deficiency or contribute to a knowledge advance. In a world permeated by digital technologies knowing revolves around being aware of one's potential contribution and being able to integrate and synthesize that contribution into new contexts, translating for others wherever they may be. In other words, knowing consists of the skills necessary to work creativity and critically to assess, reshape, synthesize and otherwise manipulate existing knowledge into new ideas, processes, and applications. Equally important, however, are the skills necessary to identify or create the networks within which specific knowledge or ideas have relevance and can be applied. As opposed to a state of being or, as stated earlier, a possession, knowledge and knowing consist of reflexive, give-and-take processes negotiated within and across multiple contexts.

The implications of MOOCs

MOOCs instantiate knowledge-making and what it means to know in a digital world by extending participation in the socio-cultural processes through which knowledge is created to a broad range of people, according to their various needs, desires, and past experiences. MOOCs attract participants through their interest in a topic and their relationships with its facilitators. In many respects a MOOC parallels a traditional network of scientists and researchers with the exceptions that its membership is much more open, potentially much larger, and it is much more flexible in its potential to take up and respond to issues, questions, and problems on an ad-hoc basis.

At the same time, the fact that MOOCs are offered within a paced and time-dependent course model limits this flexibility. The course structure represents a blending of open network models and traditional closed course models. The MOOC's massive scale maximizes participants' possi-

bilities of finding others with complementary knowledge, skills, interests and learning goals. The flexibility, speed, and tools of digital networks enable this to take place with relative freedom from constraints of space and time. Finally, because individuals determine the extent and form of their own participation, they define and own the measure of their "success" in the process. To a large extent, then, a MOOC is a reflection of a society in which citizens are active agents in the processes through which knowledge is created and disseminated.

A MOOC is a significant departure from the cliché "ivory towers" of traditional brick and mortar universities, the "walled gardens" of conventional learning management systems, and even the widely publicized "open courseware" of MIT. Each of these reifies the artifacts of knowledge work (a course, a lecture, a syllabus) within the particular technology that defines it. MOOCs, on the other hand, share the processes of knowledge work, not just the products. Facilitators model and display sensemaking and wayfinding in their disciplines. They respond to critics and challenges from participants in the course. Instead of sharing only their knowledge as is done in a typical university course, they share their sensemaking habits and their thinking processes with participants. A MOOC juxtaposes epistemology with ontology: "the medium is the message," as McLuhan would say.

With respect to a digital economy in which knowledge is the capital that defines prosperity, a MOOC invites open participation in the processes through which that knowledge is created. That includes an invitation to the skills through which networks are created to apply the knowledge generated.

Gaps in knowledge about MOOCs

Although there seems a significant congruence between the MOOC model as an educational

phenomenon and its potential to scaffold wider participation in a digital economy, the model is

so new that little can be said with certainty about its ultimate efficacy. After all, the total number

of MOOCs offered to date can be displayed on the fingers of two hands. That being said, MOOCs

continued to be offered—at least three in the six months following the submission of the proposal

which funded this knowledge synthesis as well as several planned by educators in the United

States and Europe for delivery in early 2011—and a coherent research agenda would help assess

the overall viability of the model and the conditions through which it might achieve its potential.

Specific issues, challenges and questions include:

- the capacity to support deep enquiry and the creation of sophisticated knowledge
- the breadth versus the depth of participation
- whether and under what conditions successful participation can extend beyond those with broadband access and sophisticated social networking skills
- identifying the processes and practices through which the strength of the "gravitational pull" that might encourage lurkers, or "legitimate peripheral particpants", to take on more active and central roles
- the impact or value of even peripheral participation, specifically the extent to which it might contribute to participation in the digital economy in extra-MOOC practices
- specific strategies to maximize the effective contribution of facilitators in particular and more advanced participants in general

3. What economic opportunities and challenges does the open model of participation bring into focus?

The open model of participation has economic potential, but just as it breaks with tradi-

tional notions of how knowledge is made, so it does the same with capital.

The shift from knowledge scarcity to knowledge abundance has changed the nature of business in fast capital societies. Bohemian and bourgeois ethics merge in contemporary culture (de la Fuente, 2010). Social media amplify reputation, and therefore personal branding is the means by which a great deal of creative work gains attention and audience. At the same time, the traditional enclaves of business are forced to grapple with their client base in whole new ways, as Old Spice did successfully with their viral social media campaign in summer 2010. The notion of the creative economy reflects a post-industrial emphasis on services, connections between people, and the merging of creation with consumption (Florida, 2002, Araya & Peters, 2010). Open, participatory learning networks and communities of practice (Lave & Wenger, 1991, Siemens, 2006, Shirky, 2008) reflect the emphasis the creative economy places both on innovation and lifelong learning (Lundvall, Rasmussen, & Lorenz, 2010). When change is continual and expected, people engage in learning opportunities in order to increase their personal capital and remain marketable. When the economy runs on new ideas, an effective society will mobilize its capacity to create and negotiate knowledge. MOOCs are one means by which these personal and societal goals can both be achieved.

Obviously, our economy still has many traditional elements, just as our cultural educational systems still look far more like classrooms than MOOCs. Nonetheless, the complexities of participatory capital are a present reality, and not just in ICT fields but across creative and business sectors. The distributed networks and open platforms of social media facilitate people's engagement in fields of common interest, and the operations of reputational capital serve to draw corporate sponsors towards the platforms where people engage. Concepts such as 'produsage' (Bruns, 2007) encapsulate the ways in which participants in digital culture are both creators and

consumers of content, just as, in MOOCs, learners are in a sense both creators and consumers of knowledge. The digital is a participatory society, and above all, MOOCs model participation.

The open model of participation challenges traditional notions of the ways in which value is created in the education system. Today, whatever can be easily duplicated cannot serve as the foundation for economic value. Instead of producing entities with known and approved knowledge, the digital economic model harnesses the capacity of its citizens to connect, innovate, and reconfigure the known into new knowledge. Collaboration and creativity are requirements of this new digital age (Robinson, 2001). Yet people's lives are busy and the academic cycle of publishing and knowledge-creation extraordinarily slow and self-contained. Flexible learning initiatives tailored to people's participation and agency – even without accreditation – have an extraordinary amount of potential for education.

In terms of economics, however, a key implementation challenge for taking advantage of the potential of the MOOC model is the accreditation issue. A system or systems that would allow for MOOCs, offered by different providers, to be accumulated and certified as some sort of credential will need to be explored. Whether MOOCs can be recognized in the ways traditional learning is recognized and rewarded is an issue that raises significant pedagogical questions. What would it mean to accredit a MOOC? Is there a way to do so without destroying the flexibility of the model to accommodate different levels of legitimate participation?

The opportunities for MOOCs in the digital economy centre around the potential for innovation and creativity created in knowledge negotiation. Draft research or ideas can become part of a larger knowledge discussion being negotiated online. The opportunity to innovate, create and bring new ideas to the table allows for greater cross-pollination but less duplication. This

type of iterative, shared process, however, does make it more difficult to trace the lines between participation, work, and definable return on investment. An example of such an environment in the physical world would be Silicon Valley. The knowledge growth of this region is fuelled by the integration of diverse elements: scientists/researchers, entrepreneurs, and funders. Separately, these elements provide only a fraction of the power they provide as an integrated system. Connectedness amplifies knowledge and knowledge's potential. In education, content can easily be produced: it's important but has limited economic value. Lectures also have limited value, as they're easy to record and to duplicate. Teaching – as done in most universities – can be duplicated. Learning, on the other hand, can't be duplicated.

Learning is personal, and has to occur one learner at a time. The support needed for learners to learn is a critical value point. In theory, Canada will be building on the right foundation if we shift our financial investment in education from creating content and turn it to fostering, guiding, and interacting within the learning process. But information changes so quickly that we need a way to stay on top of it. How can a lecture recorded last year be used again this year? Wouldn't we have to continually deliver new lectures to reflect knowledge growth?

Yes, if we consolidated learning in MOOC model offerings, we would need to continually redo lectures. But there would be no need to do those in isolation from existing academic offerings. How many introductory psychology courses does a field need? Educators can collaborate and share around the content needs of their discipline. Learning, however, requires a human, social element: MOOCs provide both peer-based support and interaction with subject area experts. It is in this consolidation of the many aspects of learning for a collaborative, participatory economy that MOOCs offer the broadest potential. The conditions under which MOOCs may be extend-

able to a broader range of interests and sustainable within a wage economy, however, remain to be seen.

As a digital phenomenon, a MOOC provides the means for connecting, interacting, and sharing across diverse cultures, attitudes, and skill sets in short order and with low cost. A MOOC differs from more established models of online education in its scale and openness, both of which are challenging to harness according to industrial era economics. However, in terms of reputation and credibility-building within fields, the potential of the MOOC for this type of creative economy growth is significant. Because it's free and open, it makes higher education more widely available, potentially facilitating the development of a range of human potential formerly excluded by geography, time, and/or access to conventional models of learning. And because it encourages ongoing networking and collaboration across local, regional, and national boundaries, it increases participation in the lifelong learning and collaborative practices so important for truly digital citizens. What it offers, essentially, is a locus of interest around which people can cluster and connect.

New business models increasingly focus on scaffolding connections emerging from the creative economy. The Indigo MBA, offered online by the bookselling giant, is a "self-directed course of reading for people interested in building their knowledge of business concepts and interacting with like-minded peers,"
http://www.chapters.indigo.ca/indigo-mba/indigomba-giz.html?EMS_MID=E... . Indigo sells the books and provides a site for interaction: beyond that, the course is up to participants. The subscription-based Massively Open Online Novel, The Mongoliad, http://mongoliad.com , also clusters and connects people around a common interest, generating revenue by charging a small fee that grants paying subscriber broader and deeper access to the online collaboration.

The Massively Open Online Novel brings to the fore some of the challenges surrounding eco-nomic opportunity in the open. Traditional notions of intellectual property do not work in a par-ticipatory, collaborative environment. Who owns an idea developed or improved collaboratively? Who owns the revenue deriving from it?

These are significant questions for all who work in knowledge creation and creative endeavours these days.

4. In terms of discourses, literacies, and prior knowledge, what digital skills are privileged and rewarded within the MOOC environment?

The MOOC environment is open and distributed, iterative and participatory.

MOOCs are heavily steeped in the discourse of openness. In a distributed environment a learner has to be able to put his or her ideas forward in a way that others can see and engage with, even if those ideas are not yet fully thought out or polished. Participation is a locus of knowledge building, and learners help learners by openly stating both their ideas and their challenges.

A MOOC requires production of resources from participants as the facilitators operate from a stance of participative pedagogy. Facilitators need participants who create resources and share their opinions. Each act of creation is a potential node for connection. MOOCs are a participatory environment where people are expected to own their positions and challenges openly, a process-rather than product -based model for learning. The ability to work with current digital tools to connect fragmented, diffuse, and distributed knowledge nodes, both human and artifactual, is

perhaps the most important literacy that the MOOC environment rewards. Developing one's personal knowledge and presenting it through a coherent reflection or contribution, whether by means of blog posts, concept maps, video or another tool, is a high-level digital literacy. If a participant wants to contribute at the level where his or her knowledge negotiation and role become central to others' experience of the course, then this capacity for interacting and making meaning with both people and artifacts (ie. other people's contributions, both from in and outside the course, and the technologies themselves) is key. In a MOOC, anyone can ostensibly take a leadership role. But in practice, leadership is performed through engaging with people, ideas, and tools in ways that others take up as relevant.

Whether looking to lead or not, participants in a MOOC are implicitly expected to be able to negotiate an environment in which direct instruction is rare and responsibility for the course is distributed. In the same vein, they need to be adaptable in terms of what they expect to cover. A MOOC is likely to have a more flexible syllabus than a traditional course, and most MOOCs have evolved iteratively throughout the weeks that they've been offered. Because the MOOCs offered to date have had leading-edge topics based in digital learning concepts, and these concepts are continually evolving, this iterative nature is an important aspect of the course model. Dealing with a constantly changing environment can put a great deal of strain on a participant, but this constant shift is one of the hallmarks of digital environments. A traditional course provides many points of scaffolding that allow for an otherwise safe place for a participant to experiment. In a MOOC, these scaffolds are stripped away, leaving a participant to deal with more confusion and uncertainty. Having some introductory understanding of the topic at hand can therefore be critical to the success of a given participant. Informal polling of MOOC participants suggest that learners get more out courses when they a) enter with basic digital literacies, and b) are learning

within what Vygotsky (1978) would call their zone of proximal development, rather than delving into an entirely new discourse or field. Having some pre-existing familiarity with the topic offers points of orientation and meaning-making within the course, and affords a learner currency in the transactional, networked interactions of a MOOC.

The capacity to contribute to and create a productive collaborative network is an important literacy for navigating MOOCs and the digital economy in general. In our digital culture, emphasis on network and reputation is both stronger – and differently constituted – than has traditionally been the case in school settings. Students who come to a MOOC course without the discourse of the reputational economy, or who come without the literacies to develop and sustain a network, may take far less out of a MOOC experience. The ability to present oneself effectively online is a part of building successful networks. As in any social environment, etiquette is a part of presenting oneself in a way that is both acceptable and coherent to others. Behaviours unacceptable in a professional meeting tend not to be acceptable in online negotiated knowledge environments either: this extends to a lack of reward for the student passivity that traditional transmission-based courses tend to support. MOOC participants may be confused by responses to behaviours that would be welcomed or rewarded in other course settings, and may fail to capitalize on reputational opportunities or actually damage their reputations by behaving as traditional students might.

Information literacy is also privileged and rewarded in social media and specifically in MOOCs. Being able to distinguish what one needs from what is available, to judge the value of sources, and to blend and re-frame multiple information sources into some form of communicable knowledge is necessary. Familiarity with online resources in the field of discussion, such as journals, databases, videos or lectures, would be a great time-saver and asset. Creative skills are arguably

the most critical in digital environments, since innovation is rewarded and participation needs to be performed visibly. Facilitators and learners need something to point to. When a participant in a MOOC creates an insightful blog post, a video, a concept map, or other resource/artifact it is more likely to get attention than a simple synopsis.

The simple skills of blogging/micro blogging, commenting and engaging in other forms of interactive discourse are key to the initial development of voice online. These are underwritten by the ability to quickly scan and filter through potentially vast amounts of other people's work in order to be able to find the work that can most challenge/complement one's own work. A distributed network identity that marks a participant as a product of the network he or she participates in tends to emerge as a course progresses: as in most group situations, people come to perform and be recognized for their performance of roles within the MOOC community. Technical skills that form a foundation for creativity and participation include: writing, blogging, and comprehending the etiquette of linking as a sourcing technique; downloading and installing software (like Audacity, Jing); creating podcasts, which have their own sets of skills including recording, editing, uploading files; creating and sharing video; creating and sharing mindmaps/concept maps; and posting discussions into forums like Moodle. Tracking conversations in learning management systems such as Moodle, Google Reader, or Google Alerts, and capturing important resources using software that utilizes social functionality such Delicious, Zotero, Diigo, Evernote are also assets. Previous experience engaging with others through Twitter, Facebook, Posterous, Skype, Elluminate, Second Life, Flickr or other social media platforms has been shown, in informal polls of MOOC participants, to raise the reported value and satisfaction an individual takes from a MOOC.

The MOOC environment is self-guided, a necessity in a course that may have thousands of participants. This requires that a participant is willing to engage, and has some confidence and comfort with the discourses of an autodidact and a self-starter. The ability to self-evaluate one's network and ensure diversity of ideologies is critical when information is fragmented and is at risk of being sorted by single perspectives/ideologies. Culturally, social competencies and capacity or experience in extending beyond one's own cultural context are invaluable, more so than in traditional courses. This is in part because connecting with others and putting ideas out for discussion advantages participants comfortable with these behaviours. It is also because the asynchronous nature of the course means that learners can participate internationally. The Edfutures course in spring 2010 included participants from India, Italy, and Latin America, as well as many of the English-speaking countries from around the world. The mix of contexts was arguably an advantage, in terms of learning about futures scenarios in different countries, but some centralized scaffolding from the instructors in terms of connecting and sharing across difference might have been helpful, as there were definite geographical pockets formed within the learner population. Discussion with students from within the North American cultural mainstream from which the course was offered suggested they simply felt ignorant of different contexts and therefore did not engage. There are times when a distributed model of "share as you will" leaves significant potential connections unexplored, particularly across difference.

Likewise, the literacies involved with being a self-starter are heavily embedded in traditional concepts of gender and class. Consistently taking open, declarative positions, cross-examining and critiquing the work of others, and challenging authority and received wisdom are all critical to full participation in a MOOC, yet are discourses heavily identified with privilege. This can be a

particular issue when a MOOC is popular across many different cultures that work on very different ideas of respect for power, authority and knowledge.

5. What factors limit participation?

Current educational paradigms that emphasize a return to outcomes and standardization impact the broader discourse of learning within which MOOCs exist. MOOCs, obviously, are the antithesis of grouped, normed educational initiatives that try to ensure all participants leaving a course possess the same standardized, measurable knowledge. At the conceptual level, people who are most comfortable in a formal environment will likely find the MOOC challenging and may self-limit their own participation, no matter their intent going in. Or they may struggle to get beyond a critical position in relation to the course, simply because of the structural lack of fit.

The issue of lack of accreditation or external rubber stamp may also limit participation, both in terms of people perceiving the course as less worthy or demanding of time commitment, and people sticking with the course but not participating visibly, on the basis of their own individual investment. It may be challenging for people to prioritize MOOC work without an external form of accreditation or validation tied to the experience.

It goes without saying that lack of familiarity with the digital skills privileged and rewarded within the MOOC will limit participation. So will a lack of access to the basic tools necessary to participate, specifically a computer and broadband access. Lack of experience with both the software/platforms and the content may be limiting, because MOOCs – like most digital communities and networks – operate on the assumption that people have contributions to make and know how to make them in an appropriate manner. MOOCs are voluntary and participatory, but

people new to the experience and the network may not find the level of scaffolding and support they require in order to orient themselves to that type of engagement, because support structures are not formalized.

MOOCs are global events, not regional ones in the way that university courses tend to be. Learning is a social trust-based process, and limitations of language and shared context may circumscribe people's capacity to engage with others to the full potential of the course model. George notes that the tone of discussions – sometimes intentionally negative and at other times simply based on misunderstandings – produced friction in the synchronous and asynchronous interactions of the CCK08 and CCK09 MOOCs. Strong views and opinions can create flare ups that participants may find intimidating. Differences in cultural norms and language barriers also contribute to misunderstandings. Patience, tolerance, suspension of judgment, and openness to other cultures and ideas are required to form social connections and negotiating misunderstandings.

Technology ownership and bandwidth present additional barriers – especially for participants from developing countries. Streaming video requires reasonable quality of bandwidth, and a reasonably new computer with good quality video/graphics card. Second Life sessions can create difficulty for many participants. When Dave and George taught an open course on Emerging Technologies to a group of educators from Africa, bandwidth was so poor that live audio sessions in Elluminate weren't possible. North American participants in rural and remote communities may face bandwidth challenges similar to their African peers, but even when they do not, challenges still arise with respect to such things as the possession and use of microphones, web cams, and headsets.

Time zones can also be concerns in MOOCs, especially if regular live sessions are planned. In CCK08, the facilitators ran live sessions at varying times to accommodate needs of international participants, but even then, were unable to meet the availability of all participants. Although all live sessions were recorded and the recordings made available shortly after the sessions, participants stated that the recordings still produced a feeling of isolation from others in the course. The Edfutures and PLENK 2010 MOOCs, by contrast, chose a set time for interaction, as this seemed to be easier for the majority to commit to in terms of making time and space for participation. It does, however, mean that some participants are effectively prevented from participating in the live discussion aspects of the course.

Even those for whom technological and time zone challenges do not exist may still experience challenges and hurdles to participation. The volume of information that flows through a MOOC can be very disorienting. George notes that this is intentional, and by design: "Deciding who to follow, which course concepts are important, and how to form sub-networks and sub-systems to assist in sensemaking are required to respond to information abundance." Learners often find it difficult to let go of the urge to master all the content and read all the comments and blog posts. However, in digital environments where there are no practical limits on scope or multiplicity, this sorting and sensemaking process is key. The process of coping and wayfinding is, in effect, the ontology of the digital environment. Learning to engage selectively and intentionally in the information overload of the digital world is as much a lesson – and key digital literacy – in the MOOC learning process as is mastering any specific content.

Last, the capacity of MOOC facilitators to attract and engage participants in this unfamiliar and independent environment is a genuine factor in shaping learners' participation. The reputational economy, with its emphasis on performance of knowledge, lends itself to the treatment of leaders

and innovators within fields as minor celebrities. People who are known for a particularly body of expertise will have the reputation and clout to draw a draw a critical mass of participants to a MOOC on that given topic. In the field of educational technologies where MOOCs have their origins, many of these leaders also have skills and backgrounds as educators. They have had the capacity to continue to engage participants once courses have begun, and the reflexivity to continue to improve their own facilitation practices in this new environment. However, the maxim that leaders do not always make the best teachers may be a challenge for MOOCs once the model begins to spread to fields without roots in education. The temptation to over instruct, robbing participants of independence and wayfinding, or to fail to scaffold at all, are challenges that MOOC facilitators must confront regularly in their social contract with participants. A partnership of facilitators, some with the reputation to draw a crowd and lead ground-breaking exploration, and some with the scaffolding and engagement skills needed to communicate effectively with learners, might be a workable combination.

6. How can the MOOC model help engage and develop an effective digital citizenry?

A MOOC is a collective creation of its participants, and its whole is greater than the sum of its parts. It is, in many ways, a microcosm of a nation. And just as MOOCs work only when people engage and connect from the basis of their own lives, interests, and understandings of their worlds, so an effective digital citizenry for Canada works only when people do the same. An effective digital citizenry means globally-connected Canadians with the skills and literacies to en-

gage in creating and sharing ideas in the form of digital content. It means building Canadian relationships and reputation on the world platforms of social media. It means getting beyond concepts of ICTs and embracing the digital as a participatory medium that shapes everyday lives.

MOOCs help build these skills and literacies by encouraging participants to contribute to knowledge building and negotiation at the leading edge of developing fields, and to do so in an open, distributed participatory environment. The networking and knowledge negotiation that occur in a MOOC foreground and reinforce the reputational and relational skills so necessary within the digital and the creative economies.

An effective MOOC attracts participants to an online event in which they play major roles in defining what and how they learn. The massive size of the participating group maximizes the possibility for participants to find peers who share complementary interests and skills, and with whom they can collaborate to achieve mutually defined goals. The MOOC is a largely democratic milieu in which individual participation is scaffolded by the social network. Self-defined goals and social support promote engagement.

MOOCs eschew rigid and formal entry requirements, support multiple modes of induction and engagement, and put the processes of participation on open display. In so doing, they create a broad "gravitational sphere" which can draw prospective participants into increasingly rich and sophisticated levels of contribution.

MOOCs are a first generation testing ground for knowledge growth in a distributed, global, digital world. They use digital tools to serve the learning needs of both individuals and groups on an iterative basis, and also contribute to the advancement and distribution of knowledge across a variety of fields. MOOCs reduce barriers to learning and increase the autonomy of learners as

they create, engage, and share in global interactions. The growth of digital content and social networks means that effective digital citizens need to have the technical and conceptual skills to express their ideas and engage with others. As such, MOOCs, or similar open transparent learning experiences that foster the development of citizens confidence engage and create collaboratively, are important for Canada's future as a leader in the digital economy.

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