Chapter 9

Using Visualization to Understand Transformations in Learning and Design in MOOCs

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ABSTRACT

MOOCs have captured the attention of large numbers of learners (and a few venture capitalists). Clearly something exciting and different is happening which is transforming how people learn, what people learn, as well as how learning events are designed and valued. This chapter attempts to understand these transformations, using a visualization tool (Footprints of Emergence) which enables learners, teachers, designers and researchers to reflect on, articulate, and learn from these reflections. The tool enables all of them to map the emergent and transformational aspects of learning in large groups, such as MOOCs. It requires the person engaging with the learning process to be honest and courageous – because they are engaging not only with their learning, but also with themselves and their own identities – personal, social, cultural and professional. Epistemic and ontological shifts in transformative learning are difficult, even scary and unsettling. We demonstrate how the Footprints of Emergence described here can help people to navigate through the uncertainty and unpredictability with some degree of reassurance.

INTRODUCTION

MOOCs, like many innovations before them, (print, libraries, correspondence education, radio, programmed learning, television), have transformed the numbers of people who can learn, and can be reached by universities. The Internet continues to do so. The numbers in Thrun’s Artificial Intelligence (AI) MOOC in 2012 reached over 150,000 people, with over 20,000 completions. As China joins the MOOC market, these numbers will surely grow (Gaebel, 2014). So, dynamic scaling is no longer an issue.

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That said, the next question is: what exactly (apart from the numbers), is actually transformed in MOOCs, and is it for better or for worse? The idea that the problems of learning in large classes can be solved by making them 1,000 times larger is, per se, obviously not a solution.

We need to look further than the numbers, so we examine the research and the practice of MOOCs, to identify key ways in which educational quality and delivery can be transformed. And we will also critically reflect on the contribution that our own research (to develop a creative methodology and an intuitive visualization tool) has made so far: to develop rich, empirical accounts of how learning and transformation does or does not happen in MOOCs as well as in other open learning events.

We must emphasize that we are working in a specific paradigm – qualitative rather than quantitative, and with a specific focus on emergence. Emergence (Snowden & Boone, 2007; Cilliers, 2005; Williams, Karousou & Mackness, 2011) refers to events that are ‘complex’ – as in Complex Adaptive Systems Theory: although they generally exhibit patterns as they unfold, they are unpredictable, because they involve actors who continually reflect on, change and adapt their behavior, depending on context and changes in the context (including the interventions of researchers!).

Complex events are distinguished from ‘complicated’ events (in fields such as the natural sciences) which are in principle predictable, and which are therefore amenable to quantitative, positivist research methods and epistemologies. Our focus on emergence has implications for our methodology, for the nature of the visualization tool that we are developing, and for the contribution that we hope to make in research and the understanding of learning, learning experience, personal development, and design for emergent learning events.

**TRANSFORMATION**

MOOCs started off in CCK08 (Connectivism and Connective Knowledge, 2008) as a paradox: a ‘radically open course’ in higher education, open to anyone with an internet connection. This was designed and delivered by Stephen Downes, with George Siemens, through the University of Manitoba. It was open, way beyond current practices in Open Learning, although the rapid growth of social media had already established the groundwork, as they offered exciting, fast-changing, new affordances for communication, interaction and learning (Mackness, Mak & Williams, 2010; Mak, Williams & Mackness, 2010; Kop, 2011), and it gave rise to a new framework for learning, connectivism. “Connectivism is the integration of principles explored by chaos, network, and complexity and self-organization theories. Learning is a process that occurs within nebulous environments of shifting core elements – not entirely under the control of the individual” (Siemens, 2004).

Transformations and emergence (see below) have always been key to learning, in terms of the transformations of knowledge and personal development, individual identity, and membership and participation in a professional community (Wenger, 1998). In a recent paper by Waite, Mackness, Roberts & Lovegrove (2013), the authors provide evidence of learners experiencing transformative shifts, but note that these require quite specific ‘reflection on practice, community support and self-organization’ – i.e. they require quite a bit of work on the part of all the various people involved in the learning event.

Mondahl & Razmerita (2014) describe learning as an integrated process of transformations: in knowledge, behaviour, meta-cognitive reflection and personal awareness. They cite Lauridsen’s definition of learning as “‘the process which leads to the creation of new knowledge, thus changing the learner’s behaviour and his or her understanding of the surrounding world’(2004)”, and write that “learning is