The Open University

Innovating Pedagogy 2013

Exploring new forms of teaching, learning and assessment, to guide educators and policy makers

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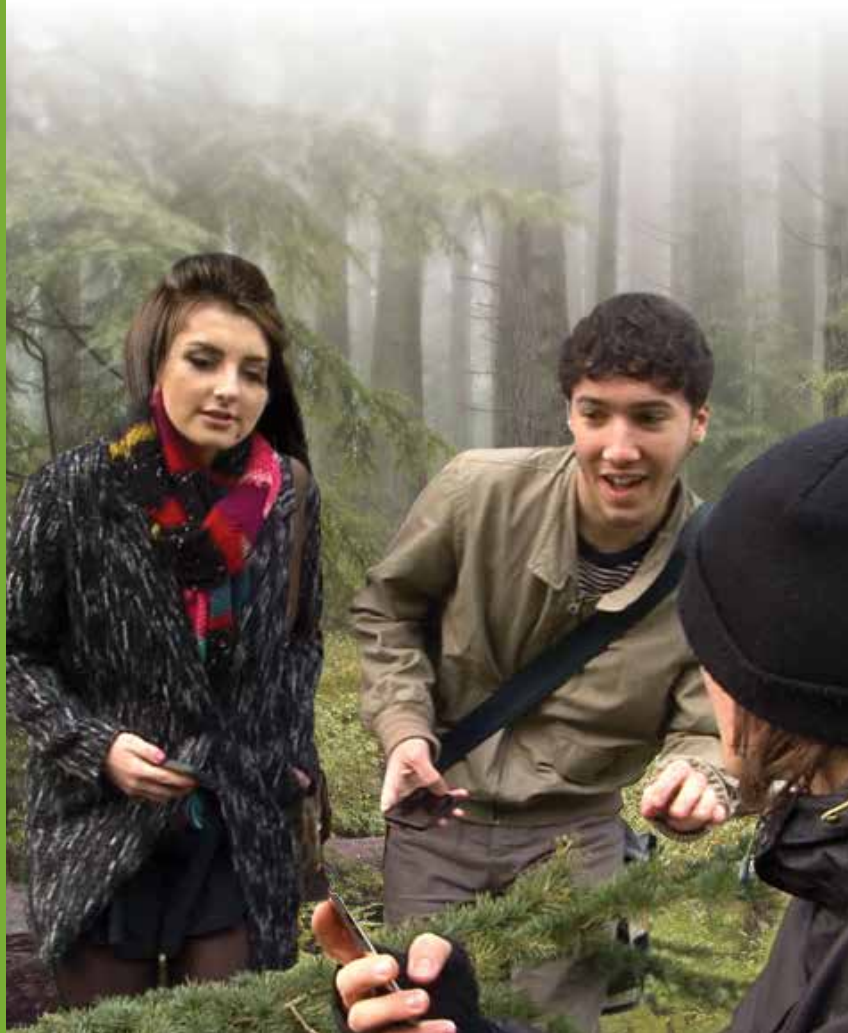
Open University Innovation Report 2



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Executive summary

This series of reports explores new forms of teaching, learning and assessment for an interactive world, in order to guide teachers and policy makers in productive innovation. This second report proposes ten innovations that are already in currency but have not yet had a profound influence on education. To produce it, a group of academics at The Open University compiled a long list of new educational terms, theories, and practices. We then pared these down to ten that have the potential to provoke major shifts in educational practice, particularly in post-school education. Lastly, we drew on published and unpublished writings to compile ten sketches of new pedagogies that might transform education. These are summarised below, starting with four updates from last year's report, followed by six new entries, in an approximate order of immediacy and timescale to widespread implementation.

1 **MOOCs:** In the past year, massive open online courses (MOOCs) have attracted interest from universities and from venture capital investors. MOOC platforms have been announced from Australia to the UK, but the focus is still currently on North America. The US-based providers Coursera, Udacity and edX are exploring business models involving paid-for assessment, the award of recognised credit, and recruitment of students to campus courses. Typically, around 20,000 learners register for a MOOC, with 5-10 percent reaching the end point. In terms of pedagogy, the currently dominant approach is a transmission model involving video lectures, recommended readings and staged assessment. MOOCs are an evolving and expanding area with new developments likely to offer greater variety of courses and more innovative social learning pedagogies. They also offer the chance to run experiments that compare teaching methods.

2 **Badges to accredit learning:** Badging offers a flexible mechanism for recognising achievements as steps towards more substantial goals. Badging can also provide an informal alternative to accreditation. During 2012, the initial infrastructure and profile for badges became established. In 2013, there are encouraging signs that the tools and infrastructure are improving, with implementations appearing for mainstream learning environments. Educators are increasing their experience of using badging to help courses run successfully online and to motivate learners. Badging implementation requires further development, for example to offer more flexible ways to provide evidence. Lack of structures that can combine badges into a common accreditation framework currently limits their use. Greater awareness and presence of badging

through social networks is still required, but the core technology of a 'badge backpack' has already been refined.

3 **Learning analytics:** Learning analytics involve the collection, analysis and reporting of large datasets relating to learners and their contexts. Current developments are focused on three areas: understanding the scope and uses of learning analytics; integrating analytics into existing courses; and expansion of learning analytics to new areas, particularly MOOCs. A central challenge is to develop analytics that are driven by key questions, rather than just querying data collected from online systems. The relation of learning design to learning analytics is also being considered, so that new teaching methods and curricula are informed by analysis of previous experience. Methods of learning analytics not only examine past interactions but also support future outcomes for students and educators. Other key issues include secure data storage, appropriate levels of access, and providing the necessary infrastructure for storing and querying large data sets.

4 **Seamless learning:** Seamless learning (connecting learning experiences across the contexts of location, time, device and social setting) is moving from research to mainstream adoption. Mobile technologies enable learners of all ages to operate across contexts, for example schools allowing students to bring their own devices. Pedagogy is emerging, based on learners starting an investigation in class, then collecting data at home or outdoors, constructing new knowledge with assistance from the software, and sharing findings in the classroom. There is also a broader notion of seamless learning arising from connected experience. Our activities online are increasingly matched to our interests: search pages order responses based on previous queries; websites recommend content related to our past viewing. The benefits are that personally relevant information may be ready to hand, but the danger is that we may come to believe that our views, preferences and connections are not just the most relevant, but all there is.

5 **Crowd learning:** Crowd learning describes the process of learning from the expertise and opinions of others, shared through online social spaces, websites, and activities. Such learning is often informal and spontaneous, and may not be recognised by the participants as a learning activity. In this model virtually anybody can be a teacher or source of knowledge, learning occurs flexibly and sporadically, can be driven by chance or specific goals, and always has direct contextual relevance to the learner. It places responsibility on individual learners to find a path through sources of knowledge and to manage the objectives of their learning. Crowd learning encourages people to be active in setting personal objectives, seeking resources, and recording achievements. It can also develop the skills needed for lifelong learning, such as self-motivation and reflection on performance. The challenge is to provide learners with ways to manage their learning and offer valuable contributions to others.

6 **Digital scholarship:** Digital scholarship refers to those changes in scholarly practice made possible by digital and networked technologies: open access publishing, open science, digital humanities, the use of social media by academics, digital and citizen science. In the information and library sciences, a focus on digital curation reflects an interest in the ability of scholars to assemble, search across and publish annotated collections of interconnected multimedia artefacts. Digital scholarship demonstrates many elements of open and networked forms of scholarship. Open-access publishing and open peer review enable sharing of knowledge. Open publishing of research datasets supports reproducible research. Engagement in open educational practices has the potential to support moves towards a more free and collegiate teaching practice.

7 **Geo-learning:** Sensors built into mobile devices, such as smartphones and tablets, can determine a user's location and provide, or trigger, context-aware educational resources in the surrounding environment. These can enable both formal and informal

learning within physical 'real-world' settings. They may also enhance and frame the subject matter being studied. For example, learning about an historical event could be situated in the place where that event occurred, giving a rich sensory experience of being in the scene. Fieldwork activities have long encompassed 'geo-learning' as a way of providing information that exploits the surroundings and landscape. Geo-learning is not new, however technologies sensitive to location, or embedded in objects near the learner, now allow greater mixing of digital information with the physical world, to produce 'blended spaces'. We need to consider carefully how we employ these opportunities for learning. Current theories are somewhat limited, but several approaches, including research into learning spaces, provide ways to model the richness of these environments and our interactions within them.

8 **Learning from gaming:** There is increasing interest in the connections between games and education. When implemented as 'edutainment' or 'gamification' of learning, teaching practices can gain superficial elements of entertainment and reward. This may encourage learners to continue, however misses the power of digital games for engagement, reflection and self-regulation. New approaches of 'intrinsic integration' are linking the motivational elements of games with specific learning activities and outcomes, so that the game-play is both engaging and educationally effective. Game designers can achieve this by developing games with elements of challenge, personal control, fantasy, and curiosity that match the pedagogy. They can manipulate aspects of 'flow' (a player's feeling of absorption in the game) and strategy to produce a productive cycle of engagement and reflection. The shared endeavours, goals and practices in games also help build affinity groups gathering learners into productive and self-organising communities.

9 **Maker culture:** Maker culture encourages informal, shared social learning focused on the construction of artefacts ranging from robots and 3D-printed models to clothing and more traditional handicrafts. Maker culture emphasises experimentation, innovation, and the testing of theory through practical, self-directed tasks. It is characterised by playful learning and encourages both the acceptance of risk taking (learning by making mistakes) and rapid iterative development. Feedback is provided through immediate testing, personal reflection, and peer validation. Learning is supported via informal mentoring and progression through a community of practice. Its popularity has increased due to the recent proliferation of affordable computing hardware and 3D printers, and available open-source software. Critics argue it is simply a rebranding of traditional hobby pursuits. Proponents contend that recent evolutions in networking technologies and hardware have enabled wider dissemination and sharing of ideas for maker learning, underpinned by a powerful pedagogy that emphasises learning through social making.

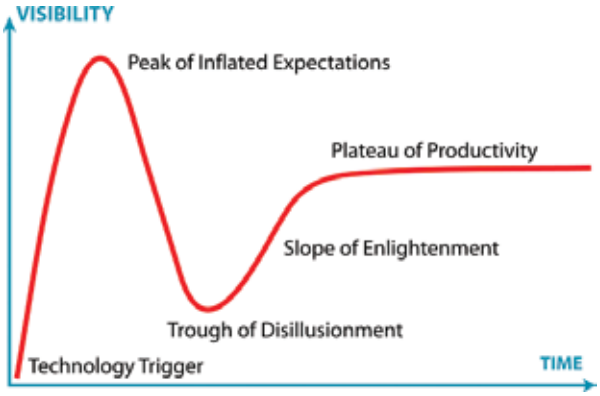
10 **Citizen inquiry:** Citizen inquiry refers to mass participation of members of the public in structured investigations. It fuses the creative knowledge building of inquiry learning with the mass collaborative participation exemplified by citizen science, changing the consumer relationship that most people have with research to one of active engagement. The concept is that people who are not research professionals engage in collaborative, inquiry-based projects. For each investigation, they gather evidence of similar successful projects, create a plan of action, carry out a controlled intervention if appropriate, collect data using desktop and mobile technologies as research tools, and validate and share findings. Citizen inquiry not only engages people in personally meaningful inquiry, it can also offer the potential to examine complex dynamic problems, such as mapping the effects of climate change, by means of thousands of people collecting and sharing local data.

Introduction

Last year, we launched a series of reports on innovations in teaching, learning and assessment. The Innovating Pedagogy reports are intended for teachers, policy makers, academics and anyone interested in how education may change over the next ten years. In this 2013 report we revisit four themes from last year and introduce six new pedagogies that are garnering interest or appearing on the horizon.

We had no doubt last year that massive open online courses (MOOCs) should be included as a theme and we indicated that the MOOC was "gaining currency". That was an understatement. The New York Times dubbed 2012 "The Year of the MOOC" and the topic has attracted worldwide publicity. New MOOC providers and platforms have emerged, including FutureLearn in the UK, iversity in Germany, OpenLearning in Australia and Miríada X in Spain. The proposition of free online courses has spread to both high school education and workplace training.

MOOCs have entered the arena of venture capital and mass marketing. In relation to the Gartner Hype Cycle, they are climbing the "peak of inflated expectations". Previous educational innovations have followed a route of over-inflated expectations, followed by disillusionment and eventual small-scale productivity. These innovations included educational television in the 1960s, language labs in the 1970s, computer-based instruction in the 1980s, integrated learning systems in the 1990s and virtual worlds for learning in the 2000s. What characterises each of these innovations is an early focus on how the revolutionary technology will transform education, followed by frustration when trying to make the technology support learning and teaching and then a long period of embedding the system into conventional education.



Gartner Hype Cycle

Formal education – whether at school, college or university level – is a super-stable system, with an interlocking set of conventions for teaching, curriculum development, recruitment, examination and accreditation that resist external change. Adding a major new innovation might disrupt the system and cause unpredictable changes, as happened with the innovation of automated trading in investment banking. More likely, it will just be absorbed. Will MOOCs cause major disruption to education? Probably not, based on past experience.

But the innovations described in this report are not technologies looking for an application in formal education. They are new ways of teaching, learning and assessment. If they are to succeed, they need to complement formal education, rather than trying to replace it.

Complementing education should not mean fossilising it. For the past 20 years, the UK Government has collected analytic data on attainment, progress and absence in England's schools. The league tables of schools, printed in national newspapers, influence decisions by parents about where to live and which schools to

choose for their children. School league tables are an example of the use of 'big data' analytics to preserve the systems of education – pushing affluent parents towards top-rated schools and traditional subjects. The analytics for learning described in this report serve a different purpose. By revealing the patterns of learning from individuals, groups and institutions, learning analytics provide continual opportunities for action, indicating ways to enhance learning and improve teaching. By bringing together MOOCs (as massive test beds for experiment outside traditional education) and learning analytics (as the means to provide dynamic evidence of the effectiveness of different teaching and learning methods) there is an opportunity for rapid, evidence-informed innovation on a grand scale.

The other innovations we describe do not have such immediate grand ambitions. They re-conceive and extend learning for an age of mobile connectivity or, in the case of maker learning, try to bring back the joy of craftwork with the help of new digital tools. They are all being explored in projects around the world, but have not yet found widespread application. None is likely to become an international media phenomenon, but together they indicate a new educational landscape that employs methods from computer gaming and social networking to support a flow of learning across locations, technologies, social interactions, and contexts. From children engaged in outdoor science explorations to engineers receiving training on the job, powerful learning comes from new ways in which activity in a particular physical and social context can be reflected upon, carried forward and shared, with the assistance of personal technologies.

As last year, this report has been written by a small group of academics in the Institute of Educational Technology and the Faculty of Mathematics, Computing and Technology at The Open University. It is based on our knowledge acquired from leading research projects, reading and writing educational research papers and blogs, holding conversations with colleagues worldwide, and surveying published and unpublished literature. We compiled the report by first producing a long list of new educational terms, theories, and practices, then paring these down to ten that have the potential to provoke major shifts in educational practice. Lastly, we drew on published and unpublished writings to compile ten sketches of new pedagogies that might transform education. We acknowledge inspiration from the NMC Horizon Report as well as other future-gazing reports on education. Those explore how innovations in technology might influence education; we examine how innovations in pedagogy might be enacted in an age of personal and networked technology.

One hundred years ago, in July 1913, Thomas Edison was quoted as saying, "Books will soon be obsolete in the public schools. … It is possible to teach every branch of human knowledge with the motion picture. Our school system will be completely changed inside of ten years." A century later, children continue to read books in school. Substitute the word 'tablet computer', 'netbook' or 'smartphone' for 'motion picture' and it would be hard to predict whether these technologies will completely change schools in five, ten, twenty years, or ever.

But, in the same newspaper article, Edison also referred to a new way of learning "through the eye", whereby children come to understand scientific concepts by viewing pictures in motion, "making the scientific truths, difficult to understand from text books, plain and clear to children." Learning from short animated movies is still a hot topic of research and is being integrated into game-based learning. New interactive software apps such as an animated periodic table and a virtual planetarium offer ways to learn "through the eye" that would have delighted Edison. The technologies may change, but the innovations in pedagogy bring lasting benefit.

> "technologies may change, but the innovations in pedagogy bring lasting benefit"

Resources

Description of the Gartner Hype Cycle:
http://www.gartner.com/technology/research/methodologies/hype-cycle.jsp

Pappano, L. (2 Nov 2012), The year of the MOOC, The New York Times
http://www.nytimes.com/2012/11/04/education/edlife/massive-open-online-courses-are-multiplying-at-a-rapid-pace.html?pagewanted=all&_r=0

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