MICROLEARNING AS INNOVATIVE PEDAGOGY FOR MOBILE LEARNING IN MOOCS

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ABSTRACT

MOOCs are open online courses offered by major universities, free to everyone, anywhere in the world. Hundreds or tens of thousands of learners enrollee in MOOCs but completion rate is extremely low, sometimes less than 10%. There is a need to explore new and more engaging forms of pedagogy to improve retention. Focusing on this need, this paper, proposes the combined use of Microlearning and Mobile Learning in MOOCs, for a new educational approach. The benefits of this new educational approach might be the development of innovative short in time learning activities in MOOCs, enabling anytime - anywhere learning, like small steps that over the day are together forming a continuous learning path.

KEYWORDS

Microlearning, Mobile Learning, MOOCs.

1. INTRODUCTION

MOOCs opened the doors of higher education to anyone with an internet connection and spread so rapidly that 2012 was declared by NY Times "The year of the MOOCs". Teaching to thousands and creating scalability challenges MOOCs provide a new context for the study of Open and Distance Education.

The aim of this paper is: a) To present MOOCs and their need to explore new and more engaging forms of pedagogy to improve retention. b) To present Mobile Learning and its use in Massive Open Online Courses. c) To present Microlearning and its two components, microcontent and microlearning activities, as pedagogy that can utilize mobile learning. d) To propose the combined use of Microlearning and Mobile Learning in MOOCs.

2. MOOCS

'MOOC' stands for 'Massive Open Online Course'. The acronym highlights the key components; i.e. that they are online courses which use open practices to educate massive numbers of students.

The innovative about MOOCs is not their online nature: 'it is the 'M' in MOOCs that underlies and influences the unique nature of the design space' (Bayne and Ross, 2014). When elite universities offer online courses for free, thousands of learners register to grab the chance to get a first-rate education creating scalability challenges. The massive nature of MOOCs harnesses the potential for learning in a large-scale (Conole, 2013). However, we are still trying to learn how to handle the scalability issues for teaching, learning, and assessment models (Kay et al., 2013).

There are many different pedagogical approaches in MOOCs, even between MOOCs in the same platform. Some are emphasizing individual learning through interactive materials while others are focusing more on social learning (Conole, 2013). On one end of the MOOC spectrum is the connectivist cMOOCs and on the other end is the cognitive-behaviorist xMOOCs offered by MITx, Coursera, and Udacity (Reilly, 2013).

The instructional design of the connectivist MOOCs consisted of multiple digital spaces with choices of tools for the learner to use built into the design of the course. Based on principles of connectivism (autonomy, connectedness, diversity, and openness), there are four types of activities: aggregation, remixing, repurposing, and feeding forward of resources and learning (Reilly, 2013).

In Coursera MOOCs, which are based on the effectiveness of online learning and Mastery Learning, learners watch short video lectures, take interactive quizzes, complete peer graded assessments, and connect with classmates and teachers. Mastery Learning helps students fully understand a topic before moving onto a more advanced topic (Coursera, 2014). In FutureLearn MOOCs: 'every course has been designed according to principles of effective learning, through storytelling, discussion, visible learning, and using community support to celebrate progress' (Futurelearn, 2014). In iversity MOOCs learners can watch videos, discuss with their peers and take quizzes and exams (iversity, 2014).

Key elements of MOOC pedagogy are peer communication, support and assessment, because of large numbers of learners and few instructors. Forums play a central role in most platforms, with diverse expectations including increasing engagement, promoting deep learning, maintaining motivation and decreasing risk of drop-out (Boyatt et al., 2014).

2.1 Dropout Rates: Need for Innovation

Many criticize MOOCs, pointing to high dropout rates and learner confusion and frustration, despite the potential of new technologies to support learning (Conole, 2013).

In 2012, the typical Coursera massive open online course (MOOC) enrolled between 40,000 and 60,000 students. In total, roughly 5 percent of students who signed up for a Coursera MOOC earned a credential signifying official completion of the course. Among students who intended to finish, roughly 24 percent successfully completed the course, compared to fewer than 2 percent in the remaining population of registered students (Koller, 2013).

The first of the working papers, which was written jointly by researchers at both universities Harvard and MIT, provides an overview of the data from 17 MOOCs: a) 841,687 people registered for the 17 MOOCs from Harvard and MIT. b) 5 % of all registrants earned a certificate of completion. c) 35 % never viewed any of the course materials. d) 54 % of those who "explored" at least half of the course content earned a certificate of completion. e) 66 % of all registrants already held a bachelor's degree or higher. f) 74 % of those who earned a certificate of completion held a bachelor's degree or higher. g) 29 % of all registrants were female. e) 3 % of all registrants were from underdeveloped countries (Kolowich, 2014).

Although high dropout rates in MOOCs can be explained in some way, it remains a challenge to improve the educational process through new innovative educational approaches in order to increase learners' satisfaction and develop a more efficient massive education. Technology can find solutions for scalability issues in MOOCs but we also need innovative pedagogies to boost human interactivity and connectivity in order to engage learners in a massive learning process.

MOOCs represent a sign of the times and there is a need to take them seriously and to make more informed pedagogically effective design decisions, leading to an enhanced learner experience and ensuring quality assurance (Conole, 2013). It is important to strive always to improve retention among highly committed learners, by exploring new and more engaging forms of pedagogy, or by adapting existing MOOCs to better fit the needs of the working adult online learner (Koller, 2013). The challenge in MOOCs is to find ways to effectively teach thousands of students simultaneously and this requires pedagogical innovation. This innovation makes MOOCs important, more than their massive enrollments (Stacey, 2013).

3. MOBILE LEARNING

Mobile Learning has been defined as: 'learning across multiple contexts, through social and content interactions, using personal electronic devices' (Crompton, 2014). It is certainly concerned with learner mobility, learning outside a classroom or in various locations. It requires nothing more than the motivation to do so wherever the opportunity arises – from books, electronic resources, places and people (Kukulska – Hulme et al., 2005).

Shrinking eLearning content to make it accessible on mobile devices might be the most intuitive approach to mLearning. Such efforts can certainly have their merits, in particular to reach distant and mobile employees. Woodill (2012), argues that the "full potential of mobile communications for learning will not be realized until we stop producing learning apps or mobile websites that simple repackage classroom materials to be read or played with on a smaller screen" (Pimmer and Pachler, 2014).

3.1 Mobile Learning & MOOCs

Coursera's free iOS and Android app is perhaps the very best way to take part in a MOOC through a phone or tablet. The app gives limited access to Coursera's list of available courses as well as any you have already signed up for. When you're already enrolled in a course, you can view its lecture videos through Coursera's app. These can be streamed or, if you plan ahead, downloaded in advance so that you don't burn through your mobile data allowance while traveling. The app is limited, though, and doesn't let you take some of the multiple-choice tests or perform peer-review assignments (Eaton, 2014).

MobiMOOC, a MOOC on mobile learning (14 mLearning topics) with 1250 learners, 17 facilitators, held in April – May 2011 and September 2012. Researchers found that mobile users engaged more frequently in learner interactions than the non-mobile users. Additionally mobile users engage more in follow-up messages leading to increased understanding. 90% of active participants said the MOOC format was appropriate for their learning communities and 77.5% accessed MobiMOOC via mobile (Waard, 2013).

4. MICROLEARNING

Microlearning is an emerging theory of learning that utilizes web content, with activities of short duration. It offers a new way of designing and organizing learning, like learning in small steps and small units of content, with structure and classification created by the learner. It is a new theory and a precise and comprehensive definition has not been given yet. New dimensions and new perspectives of the term are continually added (Kamilali and Sofianopoulou, 2013).

Microlearning is related to relatively short efforts and low degrees of time consumption. It deals with small or very small content units and rather narrow topics (Hug, T. and Friesen 2009). The focus of Microlearning is not in hierarchical classification and sequence of courses and modules but to encourage learners to become active co-producers of content through active social participation (Kerres, 2007).

Microlearning consists of Microcontent and Microlearning Activities. Microcontent is information published in short form. It may be an article on a blog, a post on Facebook or Twitter. Its length dictated by the constraints of a single main topic and the physical and technical limitations of software and devices (Dash, 2002 in Lindner, 2006). Microlearning activities are short learning experiences for learners while they are working on microcontent. Microlearning activities should be designed as to be driven by learners or created by them (Kerres, 2007).

Microlearning may vary depending on the pedagogies and media involved. It can be utilized with a range of pedagogies, including, reflective, pragmatist, conceptionalist, constructivist, connectivist, or behaviourist learning, or action-, task-, exercise-, goal- or problem-oriented learning. It can be designed for classroom learning as well as for corporate learning or continuing education, entailing processes that may be separate or concurrent, situated or integrated into other activities. It may follow iterative methods, networked patterns or certain modes of attention management entailing different degrees of awareness (Hug, T. and Friesen 2009).

4.1 Microlearning & Mobile Learning

The nature of Microlearning fits to the nature of mobile phone. Microlearning applications have to feel peripherous and casual, for being usable in a state of "Discontinuous Partial Attention" (Lindner, 2007).

Some microlearning and mobile learning research projects:

a) Researchers from MIT and Intel, demonstrated software for mobile devices designed to help users learn via "microlearning" events. The application domain is rehearsing names and faces of people in one's field or social network (Beaudin et al., 2006).

b) Researchers evaluated the flashcard system MemReflex across three user studies. Overall, the work suggests new directions for mobile microlearning and "micro activities" in general (Edge et al., 2012).

c) KnowledgePulse is a new and pioneering learning technology developed by Research Studios Austria FG. The KnowledgePulse supports knowledge acquisition by a smart system of repetition, using intelligent learning cards (Research Studios Austria FG, 2014).

d) Researchers explore the use of ubiquitous sensing in the home for context-sensitive microlearning. This work was supported by Intel Corporation. The sensors used were developed with support from National Science Foundation grant. The PlaceLab stay was funded by Microsoft Research (Beaudin et al., 2007).

4.2 Need for Research

In our rapid moving connected world we only have small 'windows' of time to devote to lifelong learning. Microlearning fits to our world and to our needs with its microcontent and microlearning activities. Although there is plenty of microcontent everywhere in the Web, there is a lack of research in microlearning activities that can utilize it in a Microlearning educational context. There is a need for research to develop and apply new innovative Microlearning strategies and study their efficiency in education.

Microlearning raises new questions of didactical design of learning activities based on microcontent and resulting in microcontent (Lindner, 2006). The small format of Microlearning does not imply simplified pedagogical strategies. On the contrary, designing microlearning scenarios becomes even more complex, as it integrates various didactical approaches (Kerres, 2007).

5. CONCLUSION

Massive open online courses need new innovative engaging forms of pedagogy in order to handle the scalability issues for teaching and learning. New pedagogical approaches need to be tested to improve retention and adapt existing MOOCs to better fit the needs of the working adult online learner.

Focus on this need, this paper presented two innovative pedagogies, mobile leaning and microlearning, in order to propose their combined use in MOOCs, for a new educational approach.

Mobile learning: a) Is method for learning on the move and has limitations in time and device use. b) Is learning across multiple contexts, through social and content interactions. c) **Is not s**hrinking eLearning content to make it accessible on mobile devices. There is a need to design learning differently: linking people in real and virtual worlds, creating learning communities between people on the move, providing expertise on demand, and supporting a lifetime of learning.

Microlearning: a) In terms of time, is related to relatively short efforts and low degrees of time consumption and in terms of content, deals with small or very small units and rather narrow topics, so fits to mobile learning limitations. b) Encourage learners to work on microcontent with individual and social activities, so fits to the social character of mobile learning. c) Have to feel peripherous and casual, for being usable in a state of "Discontinuous Partial Attention".

Mobile learning and Microlearning: They can be used together for the development of short online activities in MOOCs that can be embodied to everyday life.

As it was shown, it seems that the combined use of Microlearning and Mobile Learning in MOOCs is possible. The benefits of this new educational approach might be the development of innovative short in time learning activities in MOOCs, enabling anytime - anywhere learning, like small particles that over the day are together forming some continuous structure in the learner's mind.

REFERENCES

Beaudin, J.S., et al., 2006. *MicroLearning on a Mobile Device: Proceedings of UbiComp 2006*. Available at: http://web.media.mit.edu/~intille/papers-files/BeaudinIntilleMorris06.pdf (Accessed: 27 Aug 2014).

Beaudin, J.S.,. et al., 2007. *Context-sensitive microlearning of foreign language vocabulary on a mobile device*. Available at: http://www.ccs.neu.edu/home/intille/papers-files/BeaudinIntilleETAL07.pdf (Accessed: 25 Aug 2014).

Bayne, S. and Ross, J., 2014. *The pedagogy of the Massive Open Online Course: the UK view*. Available at: https://www.heacademy.ac.uk/resources/detail/elt/the_pedagogy_of_the_MOOC_UK_view (Accessed: 14 Sep 2014)

Boyatt, R., et al., 2014. *Exploring the Use of MOOC Discussion Forums*. Available at: http://www2.warwick.ac.uk/fac/sci/dcs/people/research/csrmaj/daniel_onah_lice14.pdf (Accessed: 26 Oct 2014).

Conole, G., 2013. *MOOCs as disruptive technologies: strategies for enhancing the learner experience and quality of MOOCs*. Available at: http://eprints.rclis.org/19388/4/Pegagogies%20for%20enhanced%20the%20learner%20 experience%20and%20quality%20of%20MOOCs.pdf (Accessed: 10 Sep 2014)

Coursera, 2014. *How it works*. Available at: www.coursera.com/about (Accessed: 9 Sep 2014)

Crompton, H., 2014. *A Diachronic Overview of Technology Contributing to Mobile Learning: A Shift Towards Student – Centered Pedagogies*. Available at: http://dspace.col.org/bitstream/123456789/514/1/pub_Mobile%20Learning _web.pdf (Accessed: 18 Sep 2014).

Dash, A., 2002. *Introducing the Microcontent Client*. Available at: http://dashes.com/anil/2002/11 /introducing-microcontent-client.html (Accessed: 5 Jul 2012)

Eaton, K., 2014. *Via Tablet or Smartphone, Learning With MOOCs*. Available at: http://www.nytimes.com/2014/06/05/technology/personaltech/Moocs-via-tablet-or-smartphone-are-gateway-to-free-education.html?_r=0 (Accessed: 12 Sep 2014)

Edge, D., et al., 2012. *MemReflex: Adaptive Flashcards for Mobile Microlearning*. Available at: http://research.microsoft.com/en-us/people/daedge/memreflex.pdf (Accessed: 10 Sep 2014)

Futurelearn, 2014. *Why it works*. Available at: www.futurelearn.com/about/why-it-works (Accessed 9 Sep 2014)

Hug, T., and Friesen, N., 2009. *Outline of a Microlearning Agenda*. Available at: http://www.elearningeuropa.info/files/media/media20252.pdf (Accessed: 2 Feb 2012)

iversity, 2014. *How does it work?* Available at: https://iversity.org/ (Accessed: 9 Sep 2014)

Kamilali, D., and Sofianopoulou, Ch., 2013. 'Lifelong Learning and Web 2.0: Microlearning and Self Directed Learning'. *Proceedings of EDULEARN13 Conference*. Barcelona, Spain, pp. 0361-0366

Kay, J., et al., 2013. *MOOCs: So Many Learners, So Much Potential*. Available at: http://sydney.edu.au/engineering/it/~judy/Homec/Pubs/2013_IEEE_AIED_MOOC.pdf (Accessed: 10 Aug 2014)

Kerres, M., 2007. Microlearning as a Challenge for Instructional Design. Available at: http://mediendidaktik.uni-due.de/sites/default/files/Microlearning-kerres_0.pdf (Accessed 31 Oct 2014)

Koller, D., 2013. *Retention and Intention in Massive Open Online Courses: In Depth*. Available at: http://www.educause.edu/ero/article/retention-and-intention-massive-open-online-courses-depth-0 (Accessed: 24 Jun 2014)

Kolowich, S., 2014. *Completion Rates Aren't the Best Way to Judge MOOCs, Researchers Say*. Available at: http://chronicle.com/blogs/wiredcampus/completion-rates-arent-the-best-way-to-judge-moocs-researchers-say/49721 (Accessed: 12 Mar 2014)

Kukulska – Hulme, Agnes and Traxler, John, 2005. *Mobile Learning. A handbook for educators and trainers*. Available at: http://english.360elib.com/datu/L/EM079254.pdf (Accessed: 14 Sep 2014)

Lindner, Martin (2006) *Learning in Micromedia Environments*. Available at: http://www.microlearning.org/ml_files /microlearning-conference2006_lindner.pdf (Accessed: 10 May 2012). .

Lindner, M., 2007. *What Is Microlearning?* Available at: http://www.microlearning.org/ml_files/lindner_in_ proceedings _2007_final.pdf (Accessed: 12 May 2012).

Pimmer, C. & Pachler, N., 2014. *Mobile Learning in the Workplace: Unlocking the Value of Mobile Technology for Work – Based Education*. Available at: http://dspace.col.org/bitstream/123456789/514/1/pub_Mobile%20Learning _web.pdf (Accessed: 18 Sep 2014).

Reilly, C., 2013. *MOOCs Deconstructed: Variables that Affect MOOC Success Rates*. Available at: http://www.editlib.org/p/115062/proceeding_115062.pdf (Accessed: 23 Sep 2014).

Stacey, P., 2013. *The Pedagogy of MOOCs*. Available at: http://mooc.efquel.org/week-9-the-pedagogy-of-moocs-by-paul-stacey/#sthash.Std4USSG.dpuf (Accessed: 3 May 2014)

Waard, de I., 2013. *Analyzing the Impact of Mobile Access on Learner Interactions in MOOC*. Available at: https://dt.athabascau.ca/jspui/bitstream/10791/23/1/Master%20thesis%20Inge%20de%20Waard%20MEd%20publica tion%20final%20reviewed.pdf (Accessed: 12 Sep 2014)

Woodill, G., 2012. *Mobile McLuhan. The medium is the message: How McLuhan might have thought of mobile learning*. Available at: http://floatlearning.com/2012/08/mobile-mcluhan/ (Accessed: 14 Oct 2012)