REVIEW ARTICLE

The rise and fall of the "Massively Open Online Courses"

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Abstract

The paper summarizes the actual debate about "massive open online courses" (MOOC), a concept that swept over like a "Tsunami" to European educators and universities since its first development in 2008. The definition of the so-called MOOCs, also referred to as a "disruptive educational innovation", however, is not very precise and has led to some irritations and scepticism. Therefore, the ideas MOOCs rely on, will be described and the pedagogical and technological background will be explained by detailed descriptions of concrete examples.

After setting the scene, the factors responsible for the initial hype about MOOCs will be analyzed as well as the upcoming criticism raised against the arguments of the MOOC proponents. The model of the Gartner hype cycle serves as a useful illustration of the ups and downs of expectations related to the introduction of educational innovations. The discussion will be supplemented by a brief flash back on prior developments in distance education. Furthermore, some recent empirical data retrieved from Google Trends are presented to underline that MOOCs are already on the descent.

Finally, the conditions for a survival of some specific applications of MOOCs at "the plateau of the cycle of expectations" will be outlined. In conclusion, MOOCs seem to have promoted, especially in the US, the use of online teaching and learning as well as the reflection about open educational resources. However, the blurred definition of the term MOOC combined with exaggerated expectations turned down the initial hype about a "disruptive innovative concept of teaching and learning" to a more modest consideration of its potential.

Keywords: connectivism, hype cycle, massive open online courses, MOOC, online learning.

Conflict of interest: None.

Definition and origin of "Massively Open Online Course" (MOOC)
MOOC stands for "Massively Open Online Course". Hence, there are four criteria: massive, open, online and course. It all began with the offers of two young Canadian researchers, who tutored in 2008 a course about "connectivism and connectivist knowledge" at Manitoba University. The young researchers were George Siemens and Steven Downes, both not having a PHD at that time with a very mixed study background, but often called the founders of MOOCs. However, two other researchers namely David Wiley and Alec Couros were a little bit faster in running an MOOC (1). The idea was to supply the students with the basic framework for the course and then lead from behind. The students were not confined to a prescribed online learning platform; they were encouraged to figure out what environment suited them. Some Spanish-speaking students even created places in "Second Life", a virtual world, where they could hold discussions in their own language. The course, called "Connectivism and Connectivist Knowledge", ended up attracting about 2,300 non-paying, non-credit students in addition to the 25 students who took it for credit through the University of Manitoba.

The learning theory that pretends to back up their approach was called "Connectivism" and is described by Siemens (2) as being composed by the following key features:

- Learning and knowledge rest in diversity of opinions.
- Learning is a process of connecting specialized nodes or information sources.
- Learning may reside in non-human appliances.
- The capacity to know more is more critical than what is currently known.
- Nurturing and maintaining connections is needed to facilitate continual learning.
- The ability to see connections between fields, ideas, and concepts is a core skill.

However, to call connectivism a "learning theory" has been criticised by many researchers as not fulfilling the requirements of a learning theory and for neglecting the work of previous scientists (3-6).

Different types of MOOCs
The connectivist background of MOOCs disappeared to some extent when in 2011 a second type of MOOC emerged, namely the xMOOCs. These courses were primarily based on interactive media, such as lectures, videos and text. The xMOOCs adopted a more behaviourist pedagogical approach, with the emphasis on individual learning, rather than on learning through peers. A number of companies were launched in the US to run xMOOCs, such as: Udacity, EdX and Coursera. The courses tend to be offered by prestigious institutions, such as Harvard and Stanford. The emphasis is on delivery of content via professors from these institutions (7). Actually, there are different types of MOOCs and a number of additional abbreviating letters. To make a difference, the connective MOOCs were called then cMOOCs. If Moocs are imbedded into traditional classroom activities in a blended learning mode, the respective MOOCs are labelled bMOOCs, which increases the variety of the "MOOC Alphabet", but not the clarity of the meaning of MOOC.
Figure 1 summarizes the MOOC types, however, without reference to the blended settings.
In the meantime, a new variant came from Harvard University: SPOCs (small, private online courses). The different concepts of MOOCs mentioned are not clearly defined and overlap to a great extent with both, traditional terminology of distance education and definition of teaching environments in classroom-based conventional teaching.

Similar to the invention of the new theory of learning "Connectivism", the concept of MOOCs created a lot of repercussions in academic debates. Before going into details, the pedagogical concepts and technical settings of past MOOCs will be briefly described.

Figure 1. Different types of MOOCs
(Source: Delta Initiative: EvolutionCombine20120927)
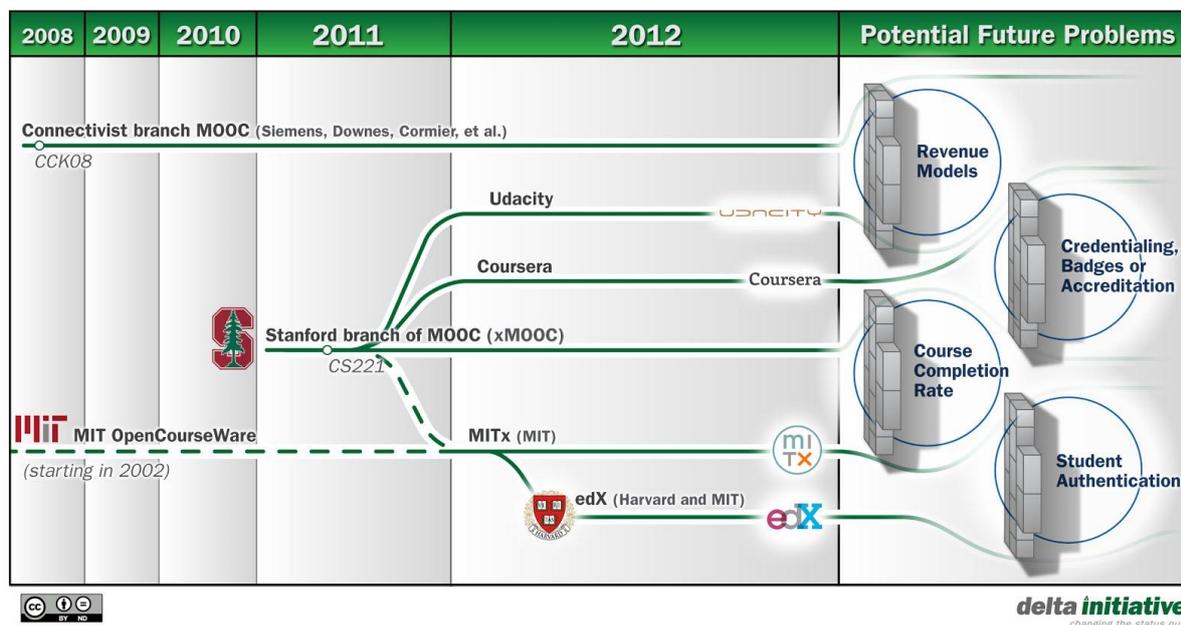
Pedagogical settings of cMOOCs

In 2012, the University of Frankfurt ran one of the first MOOCs in Germany about "Trends in eTeaching" (8,9). The participation was free of charge and all interested participants were admitted. At the beginning of each two weeks, interval participants could listen to a video streaming lecture of one hour duration with subsequent discussion. To prepare for the expert lectures, participants received some bibliographic references related to the respective topics.

As the MOOC was not part of an academic curriculum, participants could ask at the end of the course for badges that characterize their contribution and role across the entire course. Three types of badges were available: Observer (following discussions and video lectures), Commentator (giving at least three comments related to different topics by blog, video, audio, or other media), and Curator (contributing significantly to the organization and content production of the course, e.g. summing up discussions, leading subgroups etc.) (9). An example of detailed differentiation of badges is shown in Figure 2. Mozilla offers also workflows to design individual digital badges (10).

Except of the certification by badges, no exams could be taken during or at the end of the MOOC. Participants were asked to aggregate the content offered, to remix information, to contribute by writing down own ideas and to share their knowledge. They could use the tools of their own personal learning environment such as blogs, wikis, twitter posts, or Facebook. The organizers summarized the main discussion threads at the end of the two weeks rhythm and let students access them via the course website.

Figure 2. Example of badge design
(Source: http://beuthbadges.files.wordpress.com/2012/12/ple-badges1.png?w=560&h=930)
(modified by: Wolfram Laaser)

Technical requirements of cMOOCs

Which are the technical requirements to run this type of comic, which kind of programs support students and organizers in their activities to create, to certify, to assess, to collaborate, to deploy and to analyze? In a SlideShare presentation of the software used in his MOOC, Downes listed the following software components (11):

- A course WiKi on the project website provided general information about participation, topics and other general issues.
- A course Blog (to motivate discussion and give additional inputs by the tutors).
- A Moodle Forum (to run common discussions).
- PageFlakes (to add widgets for RSS (Rich Site Summary) feeds to a web page).
- Elluminate (group video conferencing tool).
- Ustream (live streaming of contributions).
- Twitter (to tweet with an identifying course tag).
- gRSShopper (harvesting content input coming from RSS feeds).
- LTC (language translation software).

Furthermore, students could subscribe to a newsletter with RSS feed and use additional software for Infographics (e.g. Wordle), formation of working groups (Google groups), storytelling (Word of Mouth), music integrator (Orchard), virtual worlds (Second life), social bookmarking, tags (11), or to create student's Blogs (Wordpress). This selection of software tools is based on available tools during the years of running the course in 2007-2008.

Currently, in many cases, different tools can be used for the various purposes mentioned (12).

Comparing cMOOCS with xMOOCs

Among the most active MOOC providers today is Coursera, a start-up that offers some 200 online courses to 1.5 million students. It does so by providing a technical platform to 33 educational institutions, including the University of Pennsylvania. According to Daphne Koller, *"Coursera is still a hugely interactive experience in terms of working with the material, which is not just video. There are a lot of exercises and assessments. Furthermore, an educational community is created based on students interacting with each other."* (13).

However, when the author (WL) picked just randomly an economics course offered by Columbia University via Coursera to look at the course description with respect to pedagogical design, it was found to resemble a traditional distance education course. The course description says: *"The class will consist of lecture videos, shot live in the classroom but then edited down into digestible segments, with integrated quiz questions and animated slide videos added. There will also be weekly quizzes and a final exam."* (14). But, there is no mention of interaction with teachers or tutors. The only difference is that anybody is admitted; there is no fee and that there is no recognized degree available. Usually, only short courses on relatively specific topics are offered. They have to be selected independently of any curriculum. Just some general remarks about necessary pre-knowledge are mentioned.

Daphne Koller (Coursera), continuing her interview responses, states: *"I think that it's wonderful for students around the world to have access to content from those universities as well. This arrangement between institutions provides economies of scale, since a single platform is an expensive and complicated thing to develop. We have almost 200 courses right now and more coming up on this hub. That's why we have 1.5 million students, and the population is growing."* (13).

Opposing to the setting of the xMOOCs, one of the cMOOC protagonists, Downes, commented on xMOOCs as follows: *"Look what they've done to my Mooc: as deployed by commercial providers they resemble television shows or digital textbooks with – at best – an online quiz component."* (15).

The hype about MOOCs

So, why those types of course setting became so popular and much discussed during the last six years? There are a number of reasons to explain this phenomenon. First of all, the young researchers did not hesitate to give a label in abbreviated form to their experiment "Massively Open Online Courses" equal to MOOC to make it sound already a widely known course concept. Abbreviations are known for chatting among young people and tend to hide a clear definition of what the terms exactly mean, e.g. eLearning, and mLearning. Furthermore, they related their concept to another newly invented label called "Connectivism", which they claimed to offer a learning theory for the 21st century. Buzz words are mostly part of a marketing strategy. By contrast, the effort to ground the concept and theoretical background on prior research is kept quite limited.

A second important factor might be the proximity to the spread of the Open Educational Resources movement, as MOOCs are actually free of matriculation fees and open to anybody regardless of the academic background. Thus, at the same time it shares the problem of covering costs with the Open Educational Resources.

As a third point, movements such as the "Edupunk" and "Do it yourself University" (16), or "P2P University"(17) can be mentioned. All these ideas claim that peers learn best from

each-other according to their specific interests and needs. The expert teacher becomes obsolete (18).

A fourth argument lies in the economic interests of multinationals to market educational content to a worldwide audience. Multinationals try to overcome cultural and national borders by introducing their courses at zero prices in an initial phase. Therefore, it is not surprising that MOOC development was supported by the US and Canadian Government as well as by organizations like Bill Gates and Linda Gates foundation or the Hewlett Packard Foundation.

Another interesting source of hidden revenue is the selling of student data to advertising companies or potential employers (19). Finally, as economic pressure and new models of education are bringing competition to the traditional models of higher education, institutions are looking for ways to control costs while still providing a high quality of service. Hence, participating in accreditation of MOOCs as part of their curriculum, economic cost reductions are expected.

The necessity to economize resources on a worldwide level is also stressed by M. Waldrop (20): *"Bricks-and-mortar campuses are unlikely to keep up with the demand for advanced education: according to one widely quoted calculation, the world would have to construct more than four new 30,000-student universities per week to accommodate the children who will reach enrolment age by 2025, let alone the millions of adults looking for further education or career training. Colleges and universities are also under tremendous financial pressure, especially in the US, where rocketing tuition fees and ever-expanding student debts have resulted in a backlash from politicians, parents and students demanding to know what their money is going towards"*.

Expectations and forecasts

"MOOCs have gained public awareness with a ferocity not seen for some time. World-renowned universities, as well as innovative start-ups such as Udacity jumped into the marketplace with huge splashes, and have garnered a tremendous amount of attention - and imitation. Designed to provide high quality online learning, offered to people regardless of their location or educational background, MOOCs have been met with enthusiasm because of their potential to reach a previously unimaginable number of learners. The notion of thousands and even tens of thousands of students participating in a single course, working at their own pace, relying on their own style of learning, and assessing each other's progress has changed the landscape of online learning. This statement was given under the heading: *"MOOCs on the Move: How Coursera Is Disrupting the Traditional Classroom"* (13).

Though the term MOOC was hardly a thought bubble for the New Media Consortium (NMC) during the discussions in 2012, the opinion of the experts changed already in their 2013 report (21). In the Horizon Report 2013, it is assumed that the time for global adoption of MOOCs in Higher Education (20% of all national educational institutions) will be a year or less (20). However, the methodology of the NMC Horizon Reports and the yearly revisions of previous forecasts have been heavily criticized by Jon Baggaley (3,4). The British Open University suggested in its innovation report a timeframe of one to two years (22). Other forecasters were more cautious and commented more in detail the factors that influence medium term trends (23).

Hence, are we in the rising part of the hype cycle? Norway, recently announced proudly a national initiative for MOOC development to promote online education and to develop a national MOOC platform (24).

Critical views about MOOCs

G. Siemens - according to Parr 2013 (15) - believes that attitudes towards MOOCs are in a period of flux and that criticism is mounting because of what he calls the "biggest failing of the big MOOC providers"; from this point of view, they are simply repackaging what is already known rather than encouraging creativity and innovation: *"There has been a growing backlash against MOOCs over the past year. If 2012 was the 'Year of the MOOC', 2013 is shaping up as the 'Year of the anti-MOOC.'"*

Schulmeister, a German pedagogue, after participation in several xMOOCs summed up the following critical points (19):

- Lack of feedback and low interaction.
- High drop-out rates.
- No reliable checking of learning outcomes and peer reviews.
- Many different subjects, but no curriculum.

To these points, the information overload in terms of quality and structure might be added especially for cMOOCs. It is not really surprising that NMC experts did not provide correct orientations of future MOOC perspectives. According to a study of the Babson Survey Research group (25), only a very small segment of higher education institutions in the US are now experimenting with MOOCs with a somewhat larger number in the planning stages. Most institutions remain undecided. According to them, only 2.6% of higher education institutions in the US currently have a MOOC, and another 9.4% which report MOOCs are in the planning stages. The majority of institutions (55.4%) report they are still undecided about MOOCs, while less than one-third (32.7%) state that they have no plans for an MOOC. Academic leaders are not concerned about MOOC instruction being accepted in the workplace, but do have concerns that credentials for MOOC completion will cause confusion about higher education degrees (problem of recognizing badges).

In a recent paper, the Conference of German University's Rectors stressed, that the use of external MOOC platforms may reduce the "visibility" of the educational institution and that the fragmentation of educational offers could lead to a "Mac Donaldization" of teaching (26). Though, no clear cut position is taken, mainly "pros" and "cons" are discussed.

As a final quotation we will mention Sebastian Thrun, who, after his first optimism about the tremendous enrolment rates for his Udacity course on "Artificial Intelligence" states later with resignation: *"We were on the front pages of newspapers and magazines, and at the same time, I was realizing, we don't educate people as others wished, or as I wished. We have a lousy product."* (27). Since Udacity was one of the first MOOC companies, and Sebastian Thrun its founder, his admission came as a shock. It signalled the decline of the MOOC empire: from 2012 when The New York Times declared it "The Year of the MOOC" to now, when its very champions, who had built their reputation and companies around the theory that free, huge, online college classes were the way to fix education, were conceding failure. Thrun retained that MOOCs were a bad product because less than ten percent of the MOOC students managed to complete each class. *"How can classes revolutionize education if no one is finishing them?"*.

The first hype about MOOCs is somehow difficult to follow as in pedagogical terms the early application of televised courses 30 years back in the US did not differ much from today's xMOOCS. About that time, the author of this paper wrote, that *"In 1984, the National Technological University began to offer courses for upgrading engineers. A consortium of 22 universities distributed their courses through the system. Classes are given as live lectures by staff of the associated universities in especially equipped classrooms and transmitted via satellite. The student at his workplace has options to pose questions via direct*

telephone links." (28). The question remains whether MOOCs represent really a disruptive innovation (see also 29).

So, is the position of MOOCs on the hype cycle rather like the one indicated in figure 3?

Figure 3. The tentative position of MOOCs in the hype cycle
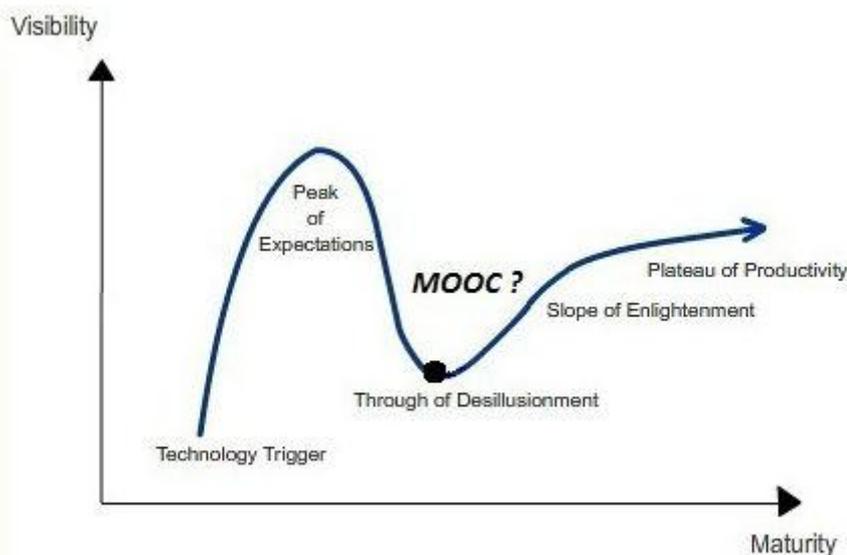

If we use the frequency of searches in Google as an indicator using Google Trends, we can observe that the interest in MOOCs started in Germany with a delay compared to the US and after reaching its highest values declines faster than in the US. The interest in MOOCs in general seems to be still declining in contrast to all exaggerated expectations and forecasts.

Remaining perspectives of MOOCs
There are a number of aspects relevant for the future survival and usefulness of MOOCs. First of all, an economic solution has to be found to finance MOOCs if they are offered free of charge. However this is a problem that MOOCs have in common with any Open Educational Resource. As our economic system is based on private property rights, it will always be difficult to offer private goods for free, or as the American economist Milton Friedman expressed: *"there is nothing like a free lunch".*

So far, several business models have been developed to charge not the course, but the connected services or certifications (Coursera charges now for the certificate). Udacity will charge in the future for tutoring support. The remaining possibilities are the financing by donations or membership contributions. *"Obviously, if sustainable models for the support of open content initiatives cannot be found in the relatively near future, most are doomed to be left by the wayside when their initial funding ceases."* (30).

Figures 4a and b. Frequency of searches in Google Trends in the US and Germany, generated in June 2014
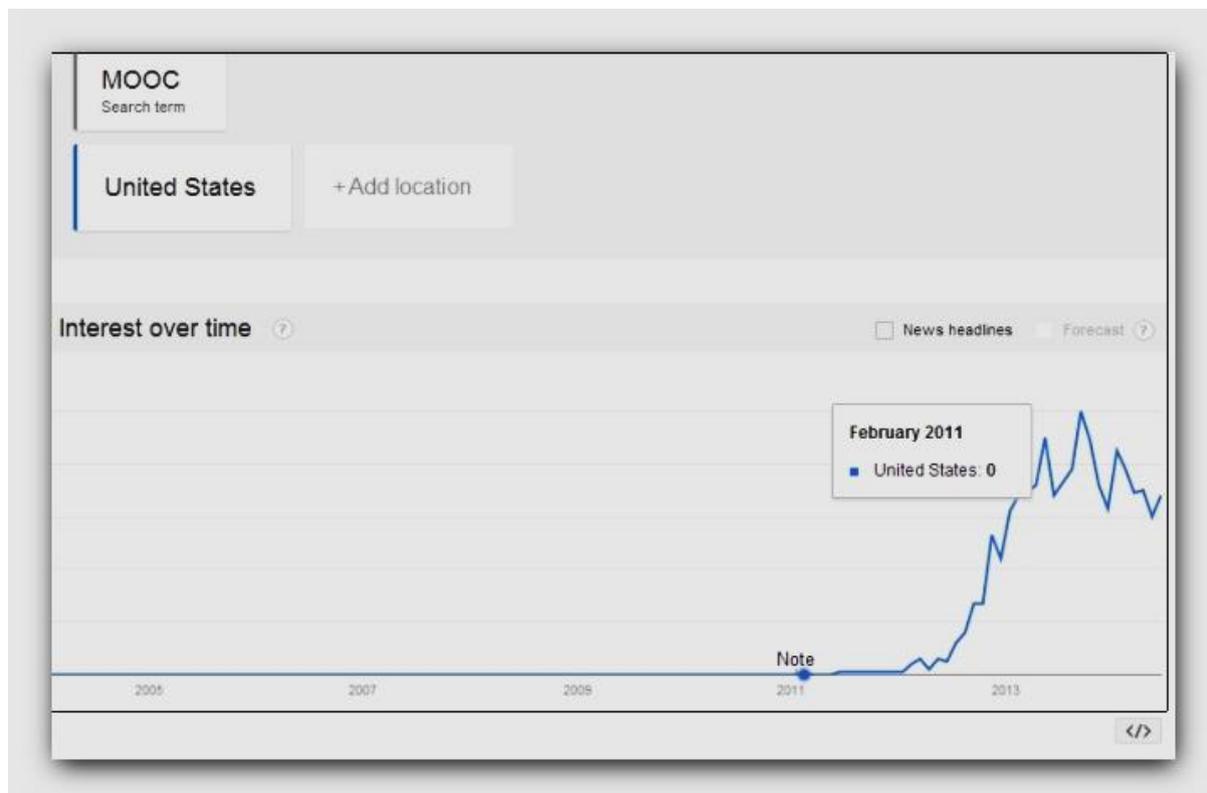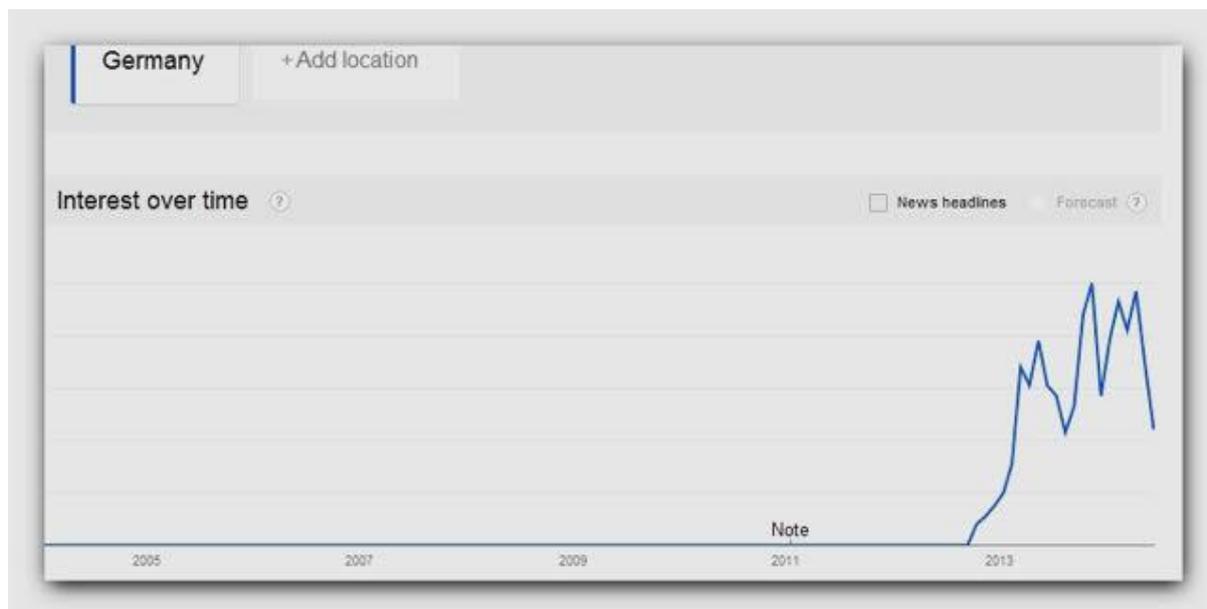
Secondly, the unique possibility to dispose about "Big Data" by using MOOCs is of great relevance to research projects. MOOCs represent by their huge international clientele a fantastic field for research studies such as learning analytics, collaboration formats and automated support of large student numbers, spontaneous formation of groups and communities of practice, behaviour of peers in online environments and analysis of intercultural communication patterns. Actual research experiences and best practise "in and around Moocs" are presented in a special edition of eLearning Papers (31). Another relevant source for Mooc research are the proceedings of the European MOOC Stakeholder Summit 2014 (32). Research topics dealt with are models, built to forecast drop-out rates, eye tracking studies, or analysis of video usage and design patterns.

To date, MOOCs have been offered usually for small courses with special content areas selected. In the future, complete degree courses will be probably offered and this will be affordable mainly for institutions that can invest huge amounts of money in attractive course presentation and marketing. This holds primarily true for xMOOCs. The future of cMOOCs seems to be even more uncertain, but future developments might show up new ways to teach specific subjects to huge and extremely heterogeneous groups of learners.

Annex

Baggaley J. Running a Mooc. https://www.youtube.com/user/JonBaggaley/videos/ (accessed: November 9, 2014).

References

1. Rodriguez CO. MOOCs and the AI-Stanford like Courses: Two successful and Distinct Course Formats for Massive Open Online Courses. EURODL, 2002.
2. Siemens G. Connectivism: Learning Theory for the Digital Age, eLearning space. 2004: http://www.elearnspace.org/Articles/connectivism.htm (accessed: November 05, 2014).
3. Baggaley J. When prophecy fails. Distance Education 2013;34:119-28.
4. Baggaley J. MOOCS: digesting the facts. Distance Education 2014;35:159-63. DOI 10.1080/01587919.2014.919710.
5. Zapata Ros M. Teorías y modelos sobre el aprendizaje en entornos conectados y ubicuos. Bases para un nuevo modelo teórico a partir de una visión critica del "conectivismo". 2012. e-prints 17463/1:
   http://eprints.rclis.org/17463/1/bases_teoricas.pdf (accessed: November 07, 2014)
6. Wade MC. A Critique of Connectivism as a Learning Theory. 2012:
   http://www.elearnspace.org/Articles/connectivism_selfamused.htm (accessed: November 06, 2014).
7. Conole G. MOOCs as disruptive technologies: strategies for enhancing the learner experience and quality of MOOCs. 2014, RED No. 39.
8. Bremer C, Thillosen A. Der deutschsrachige Open Online Course OPCO12. In: E-Learning zwischen Vision und Alltag. Bremer C, Krömker D (Eds.) Waxmann Münster, 2013.
9. Bremer C, Wedekind J. Moocs–Kurzfristiger Trend oder nachhaltiges Lehr/Lernszenario. Das Beispiel OPCO2012, Videolecture University of Hamburg, 2012: https://lecture2go.uni-hamburg.de/konferenzen/-/k/14441 (accessed: November 05, 2014).
10. Mozilla. Open Badges, 2014: https:// www.openbadges.org (accessed: November 05, 2014).

11. Downes S. The Connectivism and Connective Knowledge Course, Slideshare presentation, 2009: http://de.slideshare.net/Downes/the-connectivism-and-connective-knowledge-course (accessed: November 05, 2014).
12. Pereira J, Sanz-Santamaria S, Gutiérrez J. Comparative Technical Analysis and Prospective of the Major Open Source MOOC Platforms, RED Revista de Educación a Distancia, Nr. 44, 2014.
13. Knowledge@Wharton. MOOCs on the Move: How Coursera Is Disrupting the Traditional Classroom, 2012: http://knowledge.wharton.upenn.edu/article/moocs-on-the-move-how-coursera-is-disrupting-the-traditional-classroom/, Chicago (accessed: November 05, 2014).
14. Coursera (2014). https://www.coursera.org/course/money (accessed: November 05, 2014).
15. Parr C. Times Higher Education, Mooc creators criticise courses' lack of creativity, 2013: http://www.timeshighereducation.co.uk/news/mooc-creators-criticise-courses-lack-of-creativity/2008180.article (accessed: November 05, 2014).
16. Kamenetz A. DIYU, Edupunks, Entrepreneurs, and the Coming Transformation of Higher Education. Chelsea Green Publishing, Vermont, 2010.
17. Ahn J, Butler BS, Alam A, Webster SA. Learner Participation and Engagement in Open Online Courses, Insights from Peer 2 Peer University. MERLOT J Online Learn Teach 2013;9. http://jolt.merlot.org/vol9no2/ahn_0613.htm (accessed: November 08, 2014).
18. Keen A. The Cult of the Amateur, New York, 2007.
19. Schulmeister R. As Undercover Student in MOOCs, Keynote "Campus Innovation und Konferenztagung". University of Hamburg, 2012. https://lecture2go.uni-hamburg.de/konferenzen/-/k/14447 (accessed: November 05, 2014).
20. Waldrop MM. Online Learning: Campus 2.0, 2013: http://www.nature.com/news/online-learning-campus-2-0-1.12590 (accessed November 05, 2014).
21. NMC. Horizon Report: Higher Education Edition, 2013: http://www.nmc.org/pdf/2013-horizon-report-HE.pdf (accessed: November 05, 2014).
22. Sharples M, McAndrew P, Weller M, Ferguson R, FitzGerald E, Hirst T, Gaved M. Innovating Pedagogy 2013: Open University Innovation Report 2. Milton Keynes: The Open University, 2013.
23. Bates T. 2020 vision outlook for online learning in 2014 and way beyond. 2014: http://www.tonybates.ca/2014/01/12/2020-vision-outlook-for-online-learning-in-2014-and-way-beyond/ (accessed: November 06, 2014).
24. Creelman A. The corridor of uncertainty: Norwegian Mooc Commission. Blog, 2014: http://acreelman.blogspot.de/2014/06/norwegian-mooc-commission.html (accessed: November 05, 2014).
25. Allen IE, Seaman J. Changing Course. Ten Years of Tracking Online Education in the United States. Babson Survey Research Group and Quahog Research Group, LLC, 2013.
26. HRK. Potenziale und Probleme von MOOCs – eine Einordnung im Kontext der digitalen Lehre, Beiträge zur Hochschulpolitik 2014;2.
27. Deamicis C. A Q&A with "Godfather of MOOCs" Sebastian Thrun after he disavowed his godchild. 2014: http://pando.com/2014/05/12/a-qa-with-godfather-of-moocs-sebastian-thrun-after-he-disavowed-his-godchild/ (accessed: November 05, 2014).

28. Laaser W. Effective Methods for Meeting Student Needs in Telecommunications-Supported Distance Education: Some Lessons from Experience. In: Tutoring and Monitoring Facilities for European Open Learning. Whiting J, Bell DA (Eds.). Amsterdam, 1987. P. 98.
29. Kolovich S. The MOOC 'Revolution' may not be as disruptive as some had imagined. The Chronicle of Higher Education, 2013.
30. Wiley D, Gurrell S. A decade of development. Open Learning: The Journal of Open, Distance and e-Learning 2009;24:11-21.
31. eLearning Papers. In and around MOOCs. Special edition, 2014, Vol. 37.
32. Kress U, Kloos CD (Eds.). EMOOCS. Proceedings of the European MOOC Stakeholder Summit, 2014: http://www.emoocs2014.eu/sites/default/files/Proceedings-Moocs-Summit-2014.pdf (accessed: November 07, 2014).