From books to MOOCS: final reflections

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Introduction

The Stockholm MOOCs conference was concluded by a panel discussion, which I had the privilege to chair. Participants were Ton de Jong (Twente University), Michael Cusumano (Massachusetts Institute of Technology) and Diana Laurillard (University College London Institute of Education). Together we discussed the following major issues addressed during the symposium.

Educational design and quality of MOOCs

In order to reach out to large-scale audiences and simultaneously to downscale these audiences to small learning communities and interactions with staff and peers, the full potential of online teaching and learning is to be used, relying on new pedagogies and rich learning environments, linked to research and professional innovation.

Assessment, recognition and certification of MOOCs both at the academic level and for the jobs market

As long as the assessment issue is not solved in MOOC systems, at the academic level universities may be reluctant to recognize MOOCs for their degree programmes and certification becomes difficult. Employers may recognize badges awarded after the attendance of MOOCs in their HR and training policy.

Roles of MOOCs in the future of higher education

Originally, MOOCs were created to open knowledge to society at large, irrespective of predefined target groups to be reached. Opening up education to the public domain was the primary goal, but MOOCs were also integrated into degree subjects of home universities. Nowadays, many MOOCs are also targeted to continuous education and CPD (continuous professional development). In many countries, MOOCs have prompted a broader discussion on the use of technology-based modes of teaching and learning in blended degree education, online CPD and open education. It is expected that new modes of teaching and learning and MOOCs will have an impact on the further development of these three areas and will change the HE (higher education) landscape.

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**MOOCs and institutional leadership**

To be successful with MOOCs and the integration of technology-based modes of teaching and learning in general, innovative institutional frameworks are required to develop support structures and scenarios for learning design and course delivery, including large-scale tuition schemes and assessment approaches. This includes multi-disciplinary course teams, consisting of teaching staff, educational designers and media/internet experts. Teaching staff seem to be very much motivated to develop MOOCs as this raises academic visibility and reputation, similarly to research activities. This innovative approach to teaching and learning also affects the use of technology in degree education, since the same staff are involved. In many cases, the development of MOOCs can be considered as a ‘detour’ for innovation in mainstream degree education. This institutional policy should be supported by a governmental policy, accelerating the modernization of universities, e.g. by giving incentives for innovation to universities or making available platforms for MOOCs.

**Business models for MOOCs**

Basically, the provision of MOOCs follows the economics of online education with high fixed costs (mainly development costs) and low variable costs (mainly delivery costs), which is a condition to make the system scalable and affordable. In the case of open courses, which are delivered free of charge, this is particularly challenging. On top of this, unbundling takes place as the universities develop MOOCs, whereas external MOOC platforms deliver the course, for which services they are paid by the universities. Currently, the MOOCs business models for universities involve benefits related to reputation, recruitment and innovation and not so much to financial profit making.

**Big data and research**

From the large number of students studying MOOCs online, big data are produced. These data are a source for learning analytics, by which the learning path of students can be monitored and even adapted. Learning analytics can also be used to review the course. Big data are also useful for educational research, e.g. to optimize approaches to learning design, tuition and assessment.

In the following sections, these and some other MOOC-related issues will be discussed, thereby also taking into account the interactions with the audience during the panel session.

**MOOCs and learning design**

The hallmark of MOOCs is reaching out to massive student numbers online, making use of the openness of the internet. The targeted student groups are mainly off campus, living in different locations and in different time zones worldwide. MOOCs have realized this reach-out by switching from face-to-face classroom education to online distance education. But the pedagogy did not change so much. On the contrary, the dominant pedagogical models for MOOCs still look like an online reproduction of on campus classroom education, based on teacher – often chalk and blackboard – instruction. In many cases, MOOCs mainly consist of a
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Originally, the emphasis was mainly on large student numbers and less on quality and innovation. However, MOOCs are now also evolving to a greater variety of courses and more innovative social learning pedagogies.

To make MOOCs a success, new pedagogical models are needed in order to enrich the quality of the learning experience, to lower drop-out rates, to offer more flexibility to off-campus students worldwide, and to reach more efficient economies of scale. Therefore the full potential of ICT (information and communications technology) in teaching and learning has to be used to make MOOCs high quality, successful, flexible and cost-effective. Besides the Internet technology, this requires new and innovative pedagogies. MOOCs should be at the edge of innovation and not evolve as an obstacle to it.

Particular challenges for developing MOOCs in the future are:

(i) **Personalized teaching and learning**, by focusing on learning activities which students have to perform independently or collaboratively and by putting the students and their learning ambitions at the centre

(ii) **Small scale and intensive education**, by breaking down large numbers of students into peer groups/learning communities, which as a group interact with staff

(iii) **Dynamic assessment**, in order to monitor and adapt the study path of students and to take reliable final examinations

(iv) **Integrating a course in a larger learning environment**, linking students to research, innovation and professional domains behind the subject.

(v) **Flexible education**, adapted to students in different locations and time zones, combining study and work. This requires a specific course design and specific delivery systems with predominantly asynchronous components of online education.

As a consequence, the development of MOOCs should be led by principles of learning design, by which a coherent sequence of media, technologies and pedagogies is planned (see also Chapter 1 by Diana Laurillard in this volume). At the centre are the learner activities and the learning journey throughout the MOOC [1]. It specifies the objectives of the course, identifies the ways in which these are to be achieved and sets out how they will be assessed. The student will undertake a sequence of activities, developing knowledge and skills in a subject. Interaction with the peer group and hence social learning can be embedded in the design. Learning activities engage the student in research and innovation as well as in professional domains, e.g. by search activities, essay writing, project groups, think tanks, discussion fora, case studies or comparative observations.

Remarkably, MOOC providers ignored experience with regard to learning design and online distance education in the last few decades. Open and distance universities, by definition, do not teach groups of students in a classroom, but large groups of individual students at home with specially designed courses, increasingly delivered online. In the case of the Open University of the U.K., a personal tutor is also assigned to a group of around 20 students, as is also the case for other institutions, which is different from MOOC provisions. Hence open
and distance universities have developed new approaches to learning design, where students learn mainly independently at a distance. What in a traditional university is taught in a classroom is integrated in the study material or in the online course. With the advent of online teaching and learning, the repertoire of learning design in open and distance teaching universities has even become broader.

Recently, also conventional universities are experimenting with innovating pedagogies like the flipped classroom, virtual laboratories and seminars, learning from gaming, personal inquiry learning, etc. Hence a lot of good practices are developed which are useful for the further development of new modes of teaching and learning, and also for the development and delivery of MOOCs.

The question is how evidence-based research in new modes of teaching and learning and the current panorama of distance education and online learning can be projected to the future of HE and MOOCs in the next 20 years.

The quality of MOOCs and blended/online teaching and learning

Current MOOC platforms [Edx, Coursera, NovoEd, FutureLearn, FUN (France Université Numérique), Myriadics] influence the educational quality and the learning impact of MOOCs as they work with rather prescriptive pedagogical models (see also the introductory chapter of this volume). If current MOOC platforms are not yet providing tools for learning design involving new pedagogies, they should be changed. Successful platforms already do so, taking more advantage of the opportunities of online education. Leveraging the quality of MOOCs should be seen as the shared responsibility of platforms and institutions.

Universities consider quality assurance of MOOCs that they provide as a matter of internal quality assurance. So far, national quality assurance agencies in Europe agree with this institutional point of view and do not see a task for themselves in the quality assurance of MOOCs. This would change if MOOCs were a considerable part of a degree programme. At present, MOOCs are considered as a space for experimentation.

A quality benchmarking instrument for MOOCs, OpenupEd, was created, positioning MOOCs as open education. The OpenupEd Quality label is offered as a way of ensuring that a MOOC offers a good quality educational experience. The instrument is constructed for institutional use [2].

The panel discussion revealed that, presently, MOOCs vary in quality, but the glass can be seen as half empty or half full. Some MOOCs are seriously boring, some are exciting. There are already quite a lot of good MOOCs, e.g. those designed with a clear purpose and a potential for interactivity. It was expressed that MOOCs already show a better boring/exciting ratio than on-campus residential courses!

When MOOCs are boring, it is not the technology that prevents them from being of high quality, but it is largely due to the lack of skills of professors to design a good MOOC. The training of the teaching staff – thereby using a MOOC as illustrated in Chapter 1 by Diana Laurillard in this volume – on how to design online courses is a big challenge and could change the situation. Filling the glass is a university’s responsibility.
MOOCs are not only a movement in their own right, boosting open education. They also promote innovative practice and quality in mainstream degree education. Teaching staff involved in MOOCs also innovate education in their institutions, by integrating the MOOC into their course, but also because they become familiar with a broader spectrum of teaching and learning approaches. This innovation power of MOOCs will increase further, since the MOOC platforms engage universities in new concepts for learning design.

Impact of MOOCs on universities

So far, MOOCs have not provoked a disruption in HE systems, either in the U.S.A. or in Europe. Universities focus first on their core competences in research and education. With MOOCs and online education, HEIs (higher education institutions) are rather brought to the next level of development and not to a disruption. New developments in educational technologies serve and probably extend their mission, but do not replace it. This is shown at MIT. In the task force about the future of university education, MOOCs were only a part of what was discussed. Research and teaching mainstream students are the core mission of MIT. Besides this mission, the university is in the fortunate position that it can give tens of millions of dollars to educating the world for the social and economic benefits of us all. Hence tens of millions of dollars are given to the development of MOOCs, but this will never be an all-consuming activity for teachers, disrupting the university.

Even if universities cannot do everything, they should take advantage of the current educational technology tools. Indeed, ICT-based modes of teaching and learning have a place in HE systems of the future. As discussed in the following sections, this is the case in all three areas of provision to which HE systems evolve:

(i) By optimizing the current provision of mainstream degree education by integrating e-learning components into a blended learning approach (in all three Bologna cycles: Bachelor, Masters, doctorate)
(ii) By extending and flexibilizing the area of continuous education and CPD (short learning programmes, non-degree education) using blended or online education
(iii) By opening up education online to the public domain [OERs (open educational resources), MOOCs].

In all western HE, these three complementary areas of provision are growing, particularly by the use of blended or online formats of teaching and learning. However, this does not automatically imply that there has been innovation in pedagogy, which may remain quite ‘traditional’, as it has been so far in most MOOCs [3].

Blended degree education

Conventional universities do not show any appreciable sign of abandoning face-to-face education for their Bachelor or Masters students, even as they
increase blended education and begin to offer fully online degrees in transnational education. It is likely that they will always value traditional teaching and learning formats and combine them with online formats. These blends may vary between Bachelor and Masters programmes, and may also vary between universities. Blended teaching and learning has been introduced largely to enhance quality. Although dealing with large student numbers at a lower cost per student appears not to be a prime objective of universities, rising student numbers at flat or decreasing funding must have driven efficiencies in the system, some of which will have been enabled by ICT [3,4].

It is clear that we cannot replicate some aspects of on-campus programmes in online degree programmes, as we like to come together as human beings, in lecture halls and seminar rooms. However, the reverse is also true. The advantages of online teaching and learning cannot be replicated in on-campus courses, e.g. engaging students in more productive conversations. Hence a balance should and can be found by using blended teaching and learning, thereby making sure that the dialogical structure of knowledge and skills acquisition, and its impact on personal development will be strengthened by digitized learning.

A recent meta-analysis showed that blended learning was significantly better than traditional classroom teaching. It can only be improved if it is better designed, preferably by a multidisciplinary team [5,6]. MOOCs can be part of the blend. When they are developed by the own university, it is easier to integrate MOOCs into a degree course. However, universities are reluctant to recognize MOOCs from other universities as part of their programme as long as assessments for MOOCs cannot guarantee a sufficient level of reliability and do not deliver credits such as ECTS points. Teaching staff can stimulate students to take MOOCs from other universities and can conceive this as a learning activity in their own course. Open licensing of MOOCs (like for OERs) might facilitate this process.

Institutional recognition of a MOOC in a degree programme can look very similar to recognition rules in an exchange programme. MOOC students across all disciplines can choose a different course on the same subject or complementary course subjects, which are not available in the university. It will prevent them from trusting a single course or professor.

Flexible continuing education and CPD

In a lifelong learning perspective, universities take care of their alumni and of broader professional groups by continuous education, CPD and knowledge networking. As for these students, flexibility is needed, since they combine study and work, education and training formats will be increasingly organized in a blended form or online. Also, there will be a growing need for shorter learning programmes (probably varying from 15 to 60 ECTS points), which are to be flexibly combined with work at any moment in one’s career. This also includes education and training in collaboration with the corporate and public sector for permanent innovation in enterprises and institutions, as well as small courses and seminars for specific target groups.

Universities vary in the extent to which they offer lifelong learning at advanced levels, and it is probable that CPD is the main area in which they are active.
As a rising percentage of the population acquires a Bachelor or Masters degree, more advanced level continuous education and CPD will be needed. MOOCs can be integrated into these programmes, if they are relevant for the subject domain or the professional sector. Increasingly, MOOCs are also specifically conceived for specific continuous education and CPD. One of the first MOOC platforms, Udacity, is now focusing on this type of MOOC. Moreover, they offer combinations of MOOCs as short learning programmes, leading to so-called nanodegrees, predominantly in fields of information technology. Probably, this move to combined short learning programmes online will be followed by more academic short learning programmes from universities, which are active on other MOOC platforms.

Open education online
Open access in scientific output has already proven to be sustainable and profitable for society. OERs from the world’s top universities have been available to everyone, free of charge, for over a decade. MOOCs are now seen as the next step enhancing the circulation of knowledge and increasing the pace of innovation.

For almost all universities that have taken up the challenge of MOOCs and OERs, open education online is a new area of activity. Although open universities have been open to all regardless of their formal qualifications, they have not been free of charge, neither were their educational materials open to public view. Open online education is now taken to mean that anyone with an Internet connection can access it without a study fee [3]. MOOCs are considered as a completely new sector, building fully on the potential of the Internet.

These three areas of HE discussed are interdependent and overlapping, as the same teaching staff and departments are often operating in all three of them, and the materials and techniques developed in one area can be imported into the others. Universities view these three areas together as part of a digital education strategy. Hence institutional development in HE should embrace a holistic perspective, developing these areas separately, but also integrating them where appropriate.

Leadership
The development of blended/online education and MOOCs requires institutional leadership, which makes a university continuously innovative in all aspects of teaching and learning. This requires that:

(i) Blended/online education and MOOCs are systematically designed and implemented, supported by educational designers and media/ICT experts (online education support services)
(ii) The teaching staff is part of a professional design team for course development
(iii) The teaching staff is qualified for learning design of blended/online and MOOC formats
(iv) CPD for teachers is provided.

In order to accelerate the implementation of new modes of teaching and learning and MOOCs, public authorities (ministries, public agencies) should promote the development of enablers of change [3,4,6], including:
(i) **Leadership support for innovation**, supporting leaders who create an institution-wide and systemic innovative strategy and a continuously innovative environment, where staff are motivated to contribute to the system and are supported by teaching and learning services

(ii) **Teacher professional development**, promoting CPD in online teaching and learning, blended education, flexible continuing education and open education, which are provided by the institution; developing career plans, which value professional growth and scholarship

(iii) **Learning technology tools, systems and services**, supporting learning environments which are user-friendly and open to new pedagogies, allowing for new types of learning design, different types of learning communities and new modes of assessment

(iv) **Communities of practice**, promoting the exchange of patterns of good practice by teachers, e.g. at the subject level

(v) **Shareable resources**, stimulating the development and use of open education resources and learning design tools, which will possibly reduce the cost of education and will enable teachers to build on each other’s work

(vi) **Evaluation and research evidence**, funding research and innovation to provide evidence on new modes of teaching and learning and produce tools for developing innovative practice

Such policies have been elaborated by FUN in France and the MOOCs Committee in Norway [7,8]. They include the development and delivery of MOOCs by national MOOC platforms.

**Business models**

Business models might significantly differ in the three areas of HE discussed above: blended education in Bachelor and Masters degree programmes, online and flexible continuing education/lifelong learning, and open education by means of MOOCs. Indeed, these areas differ in terms of government funding and fees, in educational formats and in student numbers.

In the European context, the area of degree education is regulated and funded by public authorities. This leads, in most countries, to relatively low or no fees being paid by students.

The area of continuing education and CPD is not regulated. Governments do not provide funding for this area, except in the case of degrees are awarded for (short) degree programmes. The business models vary according to the target groups, the type of courses and the delivery costs. As a whole, activities are self-supporting and generate income to develop the dynamics of this area.

In the area of open education and MOOCs, the business model is based on open and free education. Content is free, but services are to be paid for according to various models. To date, income from MOOCs for universities is unsure and limited. Actually, in most cases, the cost of MOOCs is even higher than the income they generate. This would be a real issue if universities looked to MOOCs as an isolated provision of open education, which they are not. MOOCs yield a lot of
other benefits, not related to financial income, also for the other areas of provision (continuous education and blended or online degree education. That is why the business models of the three areas of provision are complementary and should be looked upon from a holistic perspective.

Universities are driven by different objectives for organizing MOOCs [9], some of which affect all areas of provision:

(i) Generating additional income, which so far still seems to be an illusion, especially because of the costs that must be paid to the platforms for MOOC delivery
(ii) Increasing the visibility and reputation of the institution, both for education and research
(iii) Reaching new target groups of students off campus, regionally and internationally
(iv) Driving student recruitment, attracting national and international students to degree programmes and to Ph.D. studies
(v) Innovating pedagogies at the university, and experimenting with online education for large student numbers, with social learning and assessment, with a view to improving the quality of teaching and learning on campus
(vi) Providing flexible learning opportunities to students (independently of place, time, space), especially for those combining study and work
(vi) Learning about scaling up education to large student numbers
(vii) Exploring cost reductions in university education
(viii) Supplementing on campus education by off-campus provisions (lifelong learning, continuing education, CPD, open education in the public domain).

Hence these broader benefits of MOOCs resulting from pursuing these objectives work out across all three areas of provision. Universities should develop a long-term vision of their role in these areas, starting from their general mission and their national or international position. In this respect, frontrunner universities show leadership by embedding the development of MOOCs in broader institutional strategies.

**MOOCs and learning analytics**

MOOC environments create big data for educational research and development as we never have seen before. In this regard, learning analytics has become an important new discipline, often defined as:

“the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimizing learning and the environments in which it occurs.” [10]

Data from tracking and management of learning activities can inform learning design by providing evidence to support the choice of media and sequence...
of activities or to adapt learning paths of students. This offers the opportunity to evolve from descriptive research only (detailing who are the students, the resources used, the certificates delivered, etc.) to design-based research focused on the development of novel educational environments, designed for better knowledge acquisition, for more active learning and for online interactions and assessment. From those research findings, new models for teaching and learning can emerge and will help to reshape HE for the better. So, design and analytics work together to support the development of successful learning and teaching.

Conclusions

So far, MOOCs have not caused a disruption in HE. They have activated the discussion about the implementation of ICT-based teaching and learning in HE provisions and announce a new development stage in HE pedagogies. This will work out in the next five to ten years, creating a new landscape for HE. MOOCs and online learning will definitely influence mainstream degree education (blended learning) and enable the expansion of the areas of continuing education (more online) and open education (completely online). New business models will be installed by which these relatively new areas will flourish, valorizing the entire educational offer of universities and contributing to the profile and mission of each of them. At the end, new concepts for HE and HE provisions will emerge.

The power of technology-based education is in the technology, by which education becomes ubiquitously accessible and flexible in all stages of people’s lifetime. But this power will only be completely valorized when joined by new pedagogies, by designing courses according to the needs of students, by enriching the learning experience in novel learning environments, and by installing learning communities and networks. This will respond to the demands of the knowledge society in general, but also to more specific needs of professions in public and private enterprises.

Frontrunner universities take the lead in this development. They shape the future instead of undergoing it. Leadership of these institutions should be supported in order to make institutions continuously innovative, which will facilitate teacher professional development, the creation of communities of practice, and the instalment of learning technology tools and systems. This will lead to systemic change in HE.

References
