Literature and Practice: A Critical Review of MOOC

Literatura y práctica: una revisión crítica acerca de los MOOC

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Abstract

This article focuses on a review of both literature and practical experiences concerning MOOC. The literature analyzed was published in peer-reviewed journals between 2007 and 2013. 268 items were selected for this study, of which 100 were analyzed in detail. The issues raised by this analysis were used as the criteria for the analysis of 10 current empirical MOOC experiences. The literature study highlighted the rapid growth in interest in understanding MOOC and seeking to understand the pedagogic frameworks most relevant to their adoption and the importance of the concept of openness embodied within them. More recently a new emphasis has been emerging where institutional factors, particularly those concerned with financial viability, certification and retention have been highlighted. The analysis of current practice showed that many of the concerns in the academic literature were absent from not only the practices embodied in current MOOC-based learning experiences but seem to have been ignored in the conceptual phase of implementing a MOOC-based teaching model. In practice therefore, most of the current MOOC offer is only a pale reflection of the conceptualization that gave them rise and has been shown to be significant in the literature. In particular the true essence encapsulated in the concept described as Openness has been largely lost in practice.

Resumen

Este artículo se enfoca en una revisión tanto de literatura como de experiencias prácticas acerca de los MOOC. Los textos analizados fueron publicados en revistas entre los años 2007 y 2013. Se seleccionaron 268 artículos para este estudio, de los cuales 100 se analizaron en detalle. Los

asuntos encontrados en la revisión se utilizaron posteriormente como criterios de análisis de 10 experiencias empíricas sobre MOOC. La literatura estudiada resalta el rápido crecimiento en el interés por comprender los MOOC, sus fundamentos pedagógicos así como la importancia del concepto de lo abierto que se encuentra en ellos. Un nuevo énfasis ha surgido recientemente en la literatura donde los factores institucionales, particularmente aquellos concernientes con la viabilidad financiera, la certificación y la deserción se encuentran resaltados. El análisis de la prácticas actuales muestra que muchos de los temas relevantes expresados en la literatura académica están ausentes no solo de las prácticas relacionadas con las experiencias de aprendizaje basadas en los MOOC sino que se han ignorado como sustento de la implementación de un modelo de enseñanza basada en ellos. Del análisis realizado se concluye que buena parte de la actual oferta de MOOC es tan solo un pálido reflejo de la conceptualización que les dio origen y que se muestra significativa en la literatura. En síntesis, la verdadera esencia del concepto de lo abierto se ha perdido en la práctica.

1. Introduction
One of the emerging international trends in the context of Technology Enhanced Learning (TEL) is the adoption of the principles of the «Open Educational Movement» (Montoya & Aguilar, 2012). This movement is built on principles that assume that knowledge is a common good (Ehlers, 2011), that belongs to humanity as a whole. In principle, therefore education is considered an engine of social development that should tend to encourage the construction and universal dissemination of knowledge, using multiple channels, including of course, those which are supported by ICT (Dans, 2009; Wiley & Hilton, 2009).

The construction of knowledge and its socialization in this context implies extensive collaboration, reuse, remixing, redistributing, inclusion, adaptation, free access and other concepts and processes associated with the notion of «openness» in education (Downes, 2013; McAuley, Stewart, Siemens & Cormier, 2010; Pirani, 2013).

Openness in education, or open education, whilst an evolving phenomenon, is not new, but has its roots in the early twentieth century. A couple of milestones mark the beginning of the movement towards open education: the creation of the International Council for Open and Distance Education in Canada in 1938, and the beginning of the Open University in the UK in 1969. Based on these early initiatives and the emerging literature on the topic, it is evident that the issue of openness has been considered seriously in the field of education for over 70 years (Barth, 1972; Walberg & Thomas, 1972).

Subsequently, adaptation, sharing, remixing and collaboration have emerged within the conceptual framework of open education, drawing on the principles and global influences of the free software movement in the late '70s and '80s and the current Open Educational Movement (Baraniuk, 2007; Wiley, 2008; D'Antoni, 2009; Ramirez, 2013).

As a consequence during the last decade multiple and diverse initiatives concerned with openness in education worldwide have emerged, most of them based on promoting access to Open Educational Resources (OER) leading to the creation, use and cataloguing of digital educational materials such as reusable learning objects, which are a type of OER (Campbell, 2004). Large numbers of teachers worldwide have been trained in these principles and a number of repositories of these materials have been created, accompanied by an equal number of outreach and familiarization strategies within the academic community (Lehman, 2007).

This activity has been built on the expectation that this strategy will bring significant benefits through resource sharing and shared expertise within the academic community and even promote innovation within education. However, a look at the daily life of educational institutions in general (and of course with a few significant exceptions) indicates that the resultant changes in educational practices is minimal (Parrish, 2004).

This has resulted in considerable reflection on the situation and it has been recognized that producing and using OERs is not sufficient to generate educational innovation, nor is enough to implement or manage repositories and give them visibility.

A possible alternative solution is move from OER production to Open Educational Practices (Ehlers, 2011). The idea, whilst in principle simple, is apparently very difficult to implement in practice: rather than focusing on the «openness» of the content the emphasis is on making the practices more open. From this perspective, we could identify one particular and very interesting open educational practice: Open Teaching, which finds a contemporary implementation in the form of MOOC (Massive Open Online Courses).

Recent research shows that MOOC are becoming a widely-discussed new phenomenon in education (Martin, 2012). Discussions highlight aspects such as the models of staff/student and student/student interactions and quality assurance related to the current online education practices based in tracking, supporting and personalized feedback may not apply to an open and massive method of learning and teaching (Marcelo, 2008; Jung, 2011). Interestingly, however, whilst many educational institutions debated the effect that MOOC might have on their practices, the considerations seem generally to have little to do with the pedagogy. At the same time, however, the growth of academic research on the MOOC in recent years is a clear indication of the interest in the phenomenon and perhaps a sense that there is a need to map what is known about existing distance education practices, looking for incomplete knowledge in this area and to deepen the theoretical and practical implications of adopting the new practices.

2. Method

In order to review the academic progress in exploring MOOC, an Integrative Review (Whittemore & Knafl, 2005) method was adopted, including two separate but closely-related processes of literature review and data analysis. The review process was carried out using the approach of Conn et al. (2003). This approach prescribes the creation of the documentary corpus review based on an appropriate selection of databases, establishing criteria for the selection and rejection of texts

leading to a process of document reduction and a final reading and re-reading process.

To ensure reliability in the review process, some actions were carried out according to Dennis et al. (1995) where the first action was to explicitly define the purpose of the review. In this case, therefore, the primary purpose of this study was to deepen understanding of MOOC and distinguish what makes them so interesting and different for the current educational landscape, at least as far as is evident from the academic research that has taken place to date. More deeply then, the review sought to glean various theoretical and practical approaches being applied to MOOC and track the evolution of the conceptual understanding as it has occurred over time.

A consistent strategy intended to constrain the review to the stated objective was developed to include and exclude texts in the review process. Within this strategy it was considered appropriate to include texts and search terms or descriptors in both English and Spanish. A documentary corpus universe was defined which included papers published in scientific journals indexed in the main academic databases: Scopus, ISI web of Knowledge, SciELO, EBSCOhost, ScienceDirect and DOAJ. Google Scholar was used to detect relevant texts derived from blog posts and other secondary sources, published by recognized scientists and academics (Liyanagunawardena, Adams & Williams, 2013). This approach yielded a document corpus of 268 texts, from which a random set of 100 items was selected that covered a period of 7 years (2007 to 2013), corresponding to the first appearance of MOOC in 2008 up to the year of the completion of this review.

These documents were read and topics or concepts that were proposed as categories of analysis related to MOOC were identified. The following search descriptors were used: «MOOC», «massive+open+course», «open+course», «massive+course» (in English and Spanish).

To minimize the level of bias in the evaluation of the items, the reading was conducted by two different observers, who separately identified key topics or concepts presented in each text which were compared using the Cohen´s Kappa coefficient (Cohen, 1968) from which observational consistency was established (Gordillo & Rodríguez, 2009). In this case the coincidence of this two records was 89% and non-coincidence was 11%. Comparison of such observations obtained a kappa coefficient of 0,67, which represents a reliable process.

The analysis of the texts was performed following the guidelines of Thematic Analysis Method (Fereday & Muir-Cochrane, 2006; Tuckett, 2005) which consist of the following: familiarization with data, initial codification, patterns search (themes), reviewing patterns, and writing an interpretation as a final report.

Familiarization with the data was performed by reviewing entries in a field diary in which the MOOC and the titles and abstracts of the selected texts were discussed. Initial coding consisted of attributing labels to emerging patterns in the data to construct the initial categories of analysis and identify others from complementary data. The search and review of patterns was conducted as a process of selection, combination and elimination based on a preliminary analysis of the data. The process ended with the description of the final categories and the writing of the results. In addition to the review of the academic literature, an additional follow-up study took place to gain a broader picture of this phenomenon

where 10 MOOC offered on different platforms were studied to determine if what is stated in the literature really is expressed in the current offer of MOOC.

3. Analysis and results

The initial results emerged from the literature review. This was used in the subsequent analysis and yielded insights corresponding to the use of MOOC in practice.

3.1. Overview of literature

The key characteristic that emerged from the review of the literature was that the analysis of the uptake of MOOC exposes two broad perspectives, one that characterizes the conceptual evolution of MOOC and another that describes their pedagogical implications.

3.1.1. A chronological point of view

A first aspect emerging from the analysis was the significant increase in papers published in 2013 (82%), compared to the previous 5 years (18%). This phenomenon was considered to be so marked that further analysis of the a limited search of Scopus involving title, abstract and keywords was conducted in March 2014 which showed that in the first three months of the year 25 papers were registered compared with 103 in the whole of 2013, 9 in 2012, and an average of 3 papers from 2011-2008.

The analysis of the content in the literature shows that conceptions about MOOC are rapidly changing through time. 75% of the papers written in the early years of the existence of MOOC describe them as learning experiences emphasizing their open components. Openness was the main and most important feature of a MOOC and massiveness was a second level of importance. Downes (2009), Siemens (2009) and Peter & Farrell (2013), show at least five attributes of openness as essential components of MOOC: free access, adaptation, remixing, sharing and collaboration with these aspects being reiterated in later work by Wiley (2012) and Siemens (2013) and Downes (2013). As an example, Siemens (2009) refers to this as a «course ecology», an alternative perspective to a single and non-modifiable course content or way to interact. No predetermination from a teacher beyond initial guidelines encourages students to create their own networks, their own content, their own learning. A number of other authors highlighted these aspects in their work (Kop, Fournier & Mak, 2011; Anderson & Dron, 2012; Anderson & McGreal, 2012). On the other hand, there was a strong emphasis in the early papers (2008 to 2010) in addressing openness from a technological point of view (Downes, 2009; Fini, 2009; Groom & Lamb, 2009). This was to seek to ensure that openness was genuinely achievable by addressing topics such as service and system interaction, practices and tools for content creation and remixing, through to content aggregation. For example: «Many people are using blogs, wikis, social networks, messaging systems, etc. The underlying idea is that people are comfortable with tools they consider to be their own, and they may wish to continue to use them when engaged in learning activities» (Fini, 2009: 2). «The central course aggregator listed 170 separate weblogs or similar RSS feeds contributed by students, each of whom used their own blog or website to participate

in discussion. [...]Additionally, thousands of comments were contributed to the central Moodle forum, three separate areas in Second Life were contributed, Google Groups were created, a Ning was created, and more. In fact, student contributions to the course continue to this day even though the course was completed in December, 2008» (Downes, 2009).

It is quite interesting to note that in recent years (2011 onwards), there is a shift from studying MOOC usage behavior to other practical considerations such as their financial viability, sustainability and issues about student retention. Examples of this approach are in Mackness, Mak & Williams, 2010; Koller, Ng, Do & Chen, 2013; Miguel, Caballe & Prieto, 2013. These follow initial work by Schmidt, Geith, Håklev & Thierstein (2009) who explored the institutional relevance of this topic and opened the discussion in the field of open education. The subsequent discussion focuses primarily on the free nature of this type of learning experiences, an aspect that causes great concern for educational institutions that traditionally support its activities from the revenue generated by the value of the material in the programs they offer.

Another major discussion of practical aspects of MOOC focuses on the alarming retention statistics, as only a minimal percentage of those who start a MOOC end it (Koller et al., 2013; Yang, Sinha, Adamson & Rose, 2013).

Certification was another topic whose incidence has been growing in recent years, with few examples in the publications from the period between 2008 and 2010 appearing consistently between 2011 to 2013 and early 2014 (Bragg, 2014; Miranda, Mangione, Orciuoli, Gaeta & Loia, 2013). It emerged that a large proportion of the MOOC student cohort are not interested in any kind of certificate or gaining academic credits; a topic explored in detail by Gibson, 2014; Pirani, 2013. From the institution perspective, the focus on certification is on the risks associated with plagiarism and academic identity substitution (North, Richardson & North, 2014; Young, 2012).

3.1.2. A pedagogical point of view

72% of the papers studied make allusion to MOOC as a disruptive concept from a pedagogical perspective. Due to the special massive and open nature of MOOC there is a consistent call to propose a different theoretical scenario to that used to currently support online education or blended learning. As a result, connectivism and peer learning, openness and the relationship between MOOC and content reuse have emerged as topics for additional attention from the theoretical perspective.

> a) Connectivism is presented as related to the very origin of the MOOC themselves, as the first instances were developed from originators who originally formulated the theoretical principles of connectivism (Nerantzi, 2012; Saadatmand & Kumpulainen, 2014) leading to various discussions about the embodiment of connectivism in the principles underpinning MOOC (Aguaded, 2013; Clarà & Barberà, 2013; George Siemens, 2013).
> However, although the initial foundation of MOOC is closely related to their connectivist principles, their massiveness necessitated the adoption of peer learning principles because of the implicit difficulties of generating customized facilitation and feedback from teachers within a massive group of stu-

dents. From this perspective, students play a dual role of learner and teacher within he small workgroup style interactions that may explicitly be structured within the cohort or may arise spontaneously. This perspective suggests that the role of educator is not the exclusive property of the teacher and can therefore move to other people, even to the students themselves, which is clearly a manifestation of its educational foundation located in peer-learning and connectivism (Conole, 2013; Siemens, 2006).

b) Literature shows that the attributes of openness that were explicit and fundamental to the original conceptualization virtually disappear in the recent literature except where it is explicitly mentioned that they are not being taken into account (Gil-Jaurena, 2013; Knox, 2013; Rodriguez, 2013). However, open attributes are still presented as factors with strong potential to cause change in teaching practices. Specifically, the aspect of openness that is not being exploited as originally conceived is the «adaptation», the openness to repurpose and reuse content. According to the above, one of the most important elements behind the idea of «Openness» is «Adaptation» (Hilton III, Wiley, Stein & Johnson, 2010). This aspect, taking into account elements such as remixing, collaboration and open access will inevitably impact on pedagogical practices such as teaching, assessment or feedback.

c) Another topic that consistently appeared in the literature about MOOC is Open Educational Resources (OER). It seems from the way these resources are related with MOOC that they are identified as a factor that ensures openness in these learning experiences. The use of OER is associated with adaptation as the main attribute of openness. Since the content can be modified by the student (adaptation of OER), the relationship between them and the content begins to change. Examples of this approach are in (Daradoumis, Bassi, Xhafa & Caballé, 2013; Pantò & Comas-Quinn, 2013)

3.2. Overview of experiences

This second phase of the review focused on testing whether both the pedagogical aspects such as handling attributes found in the literature review are found or effectively expressed in selected MOOC.

3.2.1. The MOOC designs are platform oriented

One finding from the study has to do with the similarities found in the design of these learning experiences in relation to the platforms through which they are published. This means that most MOOC offered on the same platform end up looking similar with similar content on cross-wise paths and learning behaviors. This may be because most of the platforms have generated templates or course models that course providers follow when constructing courses. Designs, however, are repeatedly and consistently failing to consider many of the basic principles of connectivism or peer learning. Most of the proposed activities are designed to be resolved individually and little peer interaction is required to learn. Moreover, neither the content or the structure of activities involve the construction or establishment of connections as a main basis for learning.

In most cases, these structures are predetermined and sequential and the student is limited to following obediently the proposed sequence. Only two of the an-

alyzed MOOC structure the interaction in activities requiring small working groups as the main channel of learning and gaining feedback.

In fact, it can observed in practice that somehow «mass» has become so important in the MOOC idea that this phenomenon has begun to create course factories (courses very similar to each other). A clear example of this is Coursera (http://coursera.org) a «provider» of MOOC that three years ago had two courses in their portfolio and now offers more than 530 which largely obey the logic proposed by Horton (2006) called WAVWAVWAVAAAQ: Watch a Video Watch a Video Watch a Video AND Attempt a Quiz.

3.2.2. Almost total absence of open attributes

The analysis also showed that all MOOC in the study offer free access and 80% of them have this feature as the main marketing attribute. At the same time though, they are almost entirely devoid of other essential attributes of openness, such as adaptation, remixing, redistributing and collaboration. This suggests «free» can be assumed to imply «open», ignoring fundamental principles of Free Software Movement, according to which there is a clear difference between «free of charge» and «free access». In the first «free» is more oriented to free as a gift, which can be used at no cost in its embodied form. The second (which is derived from the open as to open source) has to do with the possibilities of doing more, within prescribed limits, with an open item.

So, whilst access is free, being able to access their content at no cost does not imply the possibility of being able to reuse content in other contexts, modify or combine them with other digital products to create new educational resources.

On further analysis of this point, it emerged that 60% of the MOOC studied refer to the use of OER as the basis and philosophy of access to the course content. The OER principle is reinforced by explicitly citing that access to the resources is through creative commons licensing. Whilst this is implicit in the labeling of content as OER there is no evidence or suggestion as to how it can be reused. This confirms that both the content and courses suffer from the same defect: the assimilation of the concept of free to only mean free access. Thus what purports to be open content is not in fact open in the OER sense.

4. Discussion and conclusions

A growing level of discussion seems to be taking place within academic and social networks about «the MOOC phenomenon». As a result, numerous initiatives in this area have been spawned at an almost industrial level where previously the model had been institutional.

4.1. A difficult step to take

A rich, original idea that started strongly, with high expectations based on the innovative potential of openness, has, over the years, gradually becoming a mechanical formula with little genuine creativity but more focused on reaching global audiences rather than delivery through traditional academic institutions. It is worrying to see the great difficulty the academy has in transforming the pedagogical discourse around MOOC to an educational offering and practices that clearly express and demonstrate best practice. In particular there seems to be great diffi-

culty in moving from open content towards open educational practices, as accurately described by Ehlers (2011).

In particular, the emphasis is still largely on the importance of organizing and constructing to the educational content into prescribed learning experiences. We have not yet realized that by explicitly applying the attributes of the openness to educational practices it is possible to create more interesting spaces that foster true innovation that change the way in which learners and teachers can interact and relate. This may be due in part to the fact that «openness» is still a poorly understood concept. In fact, «openness» is an emerging issue with scant knowledge about it within the educational community and with a small amount of practical experience evident in this area.

Also, part of its emerging nature presents itself because its theoretical evolution as an object of study places many of its principles in a position of permanent searching for validation and discussion and practical experience that feed back into theoretical constructs. In short: it's a little known issue that raises many questions and interesting things to discover.

A second element that contributes to this discussion is that «openness» in education today is a topic related to the use of ICT. In the past, content reuse and repurposing was much less feasible and possible than it is today with electronic versions of content. The emergence of MOOC is raising awareness of this issue in a way that has previously not been happening.

4.2. The pale reflection of the MOOC

At the very beginning, the MOOC concept and the first practical experiences were developed on a restricted set of open pillars. These pillars served as the core of this concept and were characterized by reuse, remixing, collaboration and sharing in a freely-accessible environment.

In that sense, what can be observed today about the prevalent MOOC offered through the main specialized portals are a pale reflection of what a MOOC should be. In fact it would not be an exaggeration to suggest that most of the current MOOC are not MOOC anymore as few of the open principles survive. This reality confirms David Wiley´s concern about the meaning disfiguration of this acronym (Wiley, 2012).

Consideration of the full meaning of the MOOC acronym is really important when designing a course consistent with its principles in order to address the concerns raised in this paper. Of the four letters that make it up, it is perhaps the first of the «Os» (open) that is the most important to understanding its meaning and implications.

The «C» (course) generates an interesting differentiation from other learning delivery models. Being a course separates them from free access self-learning video tutorials available through the Internet. A course not only has a clear pedagogical purpose but also has provided a curricular structure to achieve its educational purpose, and has constituent components (people, resources, content, assessment, feedback, interaction spaces, etc.). All this is present in a MOOC, but is manifested and related in a very different way to that of a «typical» e-learning experience.

The second «O» (online) assumes that all the learning experience is realized through the Internet.

The «M» (Massive) seems to be the most popular feature of this concept but perhaps the most circumstantial. Being one of components that identify them, it may or may not be present. This means that a massive course may have been thought, designed and implemented to address a very large group of students, but the actual existence of such students may be due to factors beyond their design, such as those related to marketing or visibility. In other words, a MOOC is massive not because it has many students, but it was designed in case it might have many students.

In conclusion, therefore, this study has revealed that there is a growing divergence from the concept of a MOOC as defined by the acronym and the principles explored in the academic literature, and the emerging MOOC offerings. This divergence is characterized by practices that are not founded on the pedagogies upon which MOOC were designed, with the implied danger that the student experiences are likely to be less than optimal. Perhaps this insight goes some way to explain the alarmingly high drop-out rate reported consistently from MOOC providers and should form the basis for an urgent review of the practices associated with MOOC before they become unjustly discredited.

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