Preface

Since its appearance in 2008, Massive Open Online Courses (MOOCs) had been capturing attention from researchers, learning experts, even government emerging all kind of opinions, some emphasise their features and others its disadvantages. Despite of said heterogeneity, tens of MOOCs options emerge every day and thousands of people sign up for registration in available courses mainly motivated by the free of charge and because the contents are commonly offered by prestigious Universities including Harvard; Massachussets Institute of Technology; Stanford; University of California; among others. Additionally, multidisciplinary research-teams from Universities around the world daily focus their efforts in finding new alternatives for access and distribution of content in MOOCs in order to provide enhancements for better learning experiences for large number of students/users.

Brief History of MOOCs and Main Features

Probably the most significant events in MOOCs’ history were a) The launch of the well known on-line course “Connectivism & Connected Knowledge”, AKA CCK08, created by George Siemens and Stephen Downes in 2008. This course was originally thought as an alternative to offer an open-online learning experience for a small group of people, but unexpectedly it evolve to a massive learning experience having more than 2,200 registered students (Xin, Barnett & Stephens, 2015; Moe, 2015); and b) The appearance of the course “Introduction to Artificial Intelligence” in 2011. The course was offered by Peter Norvig and Sebastian Thrun, having more than 160,000 registered students from 190 countries (Xin, Barnett & Stephens, 2013).

This phenomenon motivates to many worldwide but particularly to Sebastian Thrun, which created Udacity in 2012. Udacity is an organization that provides lifelong learning options particularly in Computer Science and Math. Udacity was the first platform for MOOCs storage and management. After that, platform edX emerged from headquarters of Harvard and The Massachussets Institute of Technology, joining them The University of California in Berkeley shortly after. edX covers a wide number of knowledge areas including Music, Social Sciences, Artes, and many others. Additionally edX is a non-profit alternative (Dasarathy, et al., 2014).

In the same year, Professors Andrew Ng and Daphne Koller from Stanford University launched Coursera, having collaboration from The University of Michigan, Princeton, and The University of Pennsylvania. Currently Coursera have even two million of students, collaborates more than 40 Universities with this project and the American Council on Education authorized several courses to provide university credits (Moe, 2015).
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Even if experts have not agree yet in a standard definition for MOOCs they converge in the idea that said historical facts, particularly to render learning for a large number of people (Massiveness), could provide background for future learning theories and approaches based on distance learning (Balakrishnan, et al., 2014). Additionally, these facts allowed experts from different fields to visualize the need of technological requirements in order to guarantee good learning experiences in MOOCs. In this vein, technological advances for MOOCs include several strategies based on Computer Sciences approaches such as distributed systems, artificial intelligence, machine learning, and mobile technologies, intended to improve supporting distribution, storage, access and management of content; user accounts; and individual performance statistics, all for a large number of students (Moe, 2015).

The fact of providing learning alternatives for masses is considered one of MOOCs’ virtues, but the fuel for massiveness is openness, which offer people free registration and access to MOOCs’ content; the possibility for sharing with others knowledge, perspectives, an experience on specific topics; even to collaborate in order to improve the platform. Oppeness also encourages other benefit from MOOCs, connectivism. This aspect fosters autonomy; diversity; and interactivity among participants including students and staff. The connectivist approach in MOOCs enable students to be facilitators for other students, that could derives in “the social learning” which according to (Brinton et al., 2013) is the hidden strength of MOOCs and represents the key for scalable learning in them. Social learning could expands learning experiences and contribute to reduce massive desertion by increasing interest and engagement in students. There are several studies, such as presented in (Lim, et al., 2014; Collazos, González, & García, 2014; Brinton, et al., 2013; Nelimarkka, & Vihavainen, 2015), where authors analyze collaboration between students through small discussion groups, could inspire several ideas and possibilities in order to take advantage from collaborative activities inherent in MOOCs to achieve an adequate social learning.

Main Challenges

MOOCs’ have a high potential however its full exploitation represents big challenges -mainly focused in massiveness, openness, and connectivism- that should be tackled from different angles through multidisciplinary approaches. Ciber-social ecology of MOOCs could benefit collaboration not only among students but also institutions being able to conform learning-paths for students allowing customized curriculums selecting MOOCs from different institutions according to their learning preferences and needs (Dasarathy, et al., 2014). Another important requirement for inter-institutional collaboration is the MOOCs formalization. In this way, formal MOOCs could be part of the campus-student curriculum or conform a set of courses to obtain a diploma on-line. An example of this scenario could be found in the specialization “Mobile Cloud Computing with Android” which is hosted by Coursera (Porter, Schmidt, & White, 2014).

This collaborative environment also demands advances in software and hardware in order to support coordination among people communities caring of organized participations and measurable individual performances (Brinton, et al., 2013). MOOCs encourages grow of learning communities, and digital infrastructure systems that support MOOCs should evolve to the new needs emerged said people groups, by example fostering interactions between local and global learning communities (Dasarathy, et al., 2014).

MOOCs should adequately integrate current advances in social media in order to reinforce learning experiences helping staff and faculty to communicate with students as close as possible to traditional classroom-lectures. Setting up adequate collaborative environments becomes particularly complex in MOOCs because of the large number and variety of students with multiple learning styles being a
challenge to tailor the learning environment to fit the need of each student (Xin, Barnett & Stephens, 2013). Some strategies based on machine learning and artificial intelligence had been studied in order to simulate those communication ways used between students and faculty in large lecture courses at many universities, nevertheless the it is necessary to find an adequate correlation between interaction and machine learning (Schmidt & McCormick, 2013; Xin, Barnett & Stephens, 2013).

Accordingly to (Desarathy et al., 2014) MOOCs could help improving crowd-sourcing multi-institutional degrees and competency-based education, however it is crucial to increase effectiveness of education through MOOCs by improving quality and personalization in the student experience. Similarly, (Rose et al., 2015) emphasize the need of exploring new possibilities (e.g. incorporating tools that encourages collaborative activities such as structured brainstorming; whole group feedback; group reflections, among others) to foster and maintain desirable connections support and direction throughout the course looking for more positive experiences for students.

The adequate collaborative learning environment in MOOCs should also support a reliable scheme for students’ performance assessment. Besides of complexity by massiveness and reliability, assessment in MOOCs should face plagiarism, one of the widely discussed challenges in online education (Cooper & Sahami, 2013). In this vein, MOOCs should maintain improving openness, massiveness, and affordability but preserving academic rigor pursuing students’ success (Xin, Barnett & Stephens, 2013).

An important piece at the puzzle is to achieve well-designed interfaces that provide good learning experiences and interaction for students / users. In this way good designs could be crucial (Dow, et al., 2012). Good designs help people to do those things that we care about and complete wide tasks in our daily life (Dix, et al., 2003). When an interface offers a good design, it encourages a good user experience since interfaces become intuitive or automatic for users by a combination of well-designed interactions and practice (Harton, & Pyla, 2012). In his MOOC of Human Computer Interaction hosted by Coursera, Professor Scott Klemmer states that intuitivity in interfaces means “To shifts attention from manipulating an interface to accomplishing a task”.

To achieve great designs is not easy; it demands a lot of hard work and creativity however Human-Computer Interaction provides specific techniques, methods, approaches, and tools to design, implement and evaluate user interfaces. Another essentially is the User Centered Design approach, which according to (Lowdermilk, 2013) is a multidisciplinary design approach based on the active involvement of users to improve the understanding of user and task requirements.

**WHAT ABOUT THIS BOOK?**

The main intention of this book is to provide a set of strategies based on principles and approaches from Human-Computer Interaction and User Centered Design aimed to contribute in improving designs of interactions in MOOCs. Here are described meaningful insights focused in aspects that could benefit massiveness, openness, and connectivism in MOOCs. In this vein, the book concentrates proposals oriented to fostering social learning and its implication for collaborative spaces; design strategies; inclusion of diverse users; assessment for a large number of users; and some envisions, ideas, approaches and applications to explore as future work.
Organization of the Book

The book is organized into sixteen chapters. A brief description of each of the chapters follows:

Chapter 1 explores a variety of technologies and pedagogical approaches that can be employed in a MOOC environment to promote collaboration and student interaction. These alternatives are aimed to foster the clarification of ideas, provide access to peer-feedback and promote the sharing of diverse and alternate perspectives. This chapter discuss benefits and drawbacks of said technologies in order to help guide decisions about the instructional design of MOOCs. The chapter emphasize collaborative learning as a key design principle for MOOCs considering that interactions facilitated through this kind of learning are as valuable as the direct instruction provided by the teacher.

Chapter 2 present the findings obtained from the implementation of a MOOCs strategy to reinforce a government program to reduce digital divide in Aguascalientes, Mexico.). The proposal is oriented to Foster connectivism and social learning in order to achieve a vast digital competencies distribution and appropriation. Study’s results suggested an increment in digital competencies among participants and a good acceptance of contents.

Chapter 3 emphasizes one of the principal issues in current model of open learning the lack of personalization. This chapter discuss a particular perception on the importance of to provide personalization in MOOCs suggesting an alternative based on the consideration of the multiple learning styles, which is oriented to preserve openness, massiveness and connectivism in MOOCs.

Chapter 4 review the basic challenges and concerns faced when users set up and use web filtering systems for children, emphasizing those features for interactive elements at user interfaces that could improve the users’ experience and satisfaction, which could finally derive in adequate protection for kids when using MOOCs and their integrated social tools.

Chapter 5 highlights those interactive elements offered by the current most popular MOOCs providers; edX, Coursera, and Udacity, in order to establish a first draft of basic interactions for MOOCs. The main objective is to provide designers a starting point on which interactions should be included as basics in every MOOC scaffolding those particular interactions needed to offer a complete learning experience for users, e.g. chemistry virtual lab.

Chapter 6 describes a study aimed to investigate the learning elements which would offer students a sense of connection and deeper understanding of concepts by means of online community-based practices. This chapter reports on the findings from surveying 3,000 students that enrolled in free online offerings at Open2Study. The findings of this chapter may contribute to reduce important gaps in MOOCs often criticized for having very low completion rates, not contributing much to the development of higher order thinking skills, and lacking academic rigor.

Chapter 7 presents a proposal to design notifications conveyed from MOOCs to users. The strategy is based on the three basic types of interaction/communication in MOOCs: User-User; User-Platform (content); User-group which helped to extracting the essential notifications from MOOCs and then specify them into a pattern-based structure which could be easily incorporated into the systems life cycle. The main target of this proposal is to contribute both to facilitate designers to create well designed notifications for MOOCs and to enhance user experience through its final application.

Chapter 8 reveals specific accessibility requirements that need to be considered in the design, implementation and evaluation of Massive Open Online Courses (MOOCs) to ensure they are inclusive. Authors emphasize the particular needs, preferences, skills and situations of diverse learners which should be considered in MOOCs to provide good learning experiences. Additionally, authors analyze some ac-
accessibility evaluation tools and approaches that identify accessibility problems in the content, semantic and structural elements of a website that can be used to evaluate the level of accessibility of MOOCs.

Chapter 9 presents a set of guidelines for designing hearing messages that help blind students to navigate in a MOOC’s interface and contents. Authors bring to the front the importance of considering concepts of universal access from the earliest stage in the design process of MOOCs particularly those used by blind people. They concluded that even if external accessible tools -such as screen readers and auditory interfaces- are useful, could not be required if blind users requirements were taking into account by design.

Chapter 10 introduces a new perspective to design inclusive interfaces for MOOCs in order to ensure massive access to online learning worldwide. The chapter emphasizes the fact that MOOCs have been used not only by undergraduate and high school students, but also by Elder people and even children. Said diversity represents one of the principal challenges in MOOCs’ accessibility in order to guarantee a delightful user experience by offering better educational programs for cognitive disabled users. This chapter is aimed to contribute in this big effort.

Chapter 11 describes an evaluation approach for MOOCs using an exam preparation system designed to generate exams for propositional logic. The expert assessment tool was used to generate initial learning data for Markov Logic Network and then the result was analyzed in terms of evaluation conducted on students. Authors found that there was no significant difference between problems prepared by a human examiner and problems generated by the proposed tool.

Chapter 12 proposes a platform called SPLASHED: Software Platform for Large-Scale Assessment of Software-Development for Education-at-a-Distance, that uses Linux containers to provide OS-level virtualization. SPLASHED platform applies recent advances in Linux container deployment automation, resources isolation, portability, and usability. The Authors explores assignments as a case study showing how the SPLASHED platform will able to accommodate and facilitate advanced Software Development courses with features and abilities currently not available.

Chapter 13 clarify - from a theoretical perspective - the interaction role in MOOCs and increased emphasis on utilization the virtual worlds as tools to create a constructive process where the learner should be actively involved. Authors presents an interaction model based on collaboration, so as to elucidate the major design differences between current MOOCs environments and those envisioned implementing virtual worlds emphasizing the changing role of formal learning in an open education era where the MOOCs could allow access for all, in many cases free of charge.

Chapter 14 highlights the importance of integrating new interactive elements in MOOCs. Specifically, the Author focuses in the benefits of introducing Gamification elements in order to commitment the learners for completing the courses, with willingness and pleasure. The chapter presents a whole context on the gamification concept including a theoretical background of combined with the principles of user experience (UX); a description of design guidelines for the MOOCs’ interfaces and their involvement of learning theories; and game-based learning theory. All this knowledge is then putting together into a design proposal for the interface of MOOCs that will engaged UX with elements of Gamification.

Chapter 15 explains the importance of use Augmented Reality in MOOCs in order to improve its inherent advantages. This study further shows the development tools, application areas, and results obtained through augmented reality in the education, as a support tool to achieve the primary objective of education, which is learning through the use of MOOCs.

Chapter 16 analyzes possible benefits of integrating MOOCs specific supervision techniques used traditionally for therapy. The idea is to incorporate a sending-reports strategy in order to inform counsel-
ors about the performance of students. Authors describe the findings obtained from a study case using Moodle platform where 95 clinical psychologists participated in order to analyze reports from students enrolled in an addiction prevention course.

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REFERENCES


