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An eight steps approach towards the creation of Massive Open Online Courses

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Abstract— Distance learning, where students take courses while being physically separated from their teachers for majority of the duration of the course is by no means a new phenomenon. It has been delivered through mail, radio and TV and recently through the Internet. Distance learning provides limited interaction between students and lectures and rarely any collaboration among the students themselves. Which approach we will use to solve this problem? We will base our work upon MOOCs, which offers openly online courses, for free, to students anywhere in the world. This paper describes the eight steps approach towards the creation of a MOOC.

Keywords— online education, Massive open online courses (MOOCs), e-learning, open learning.

I. INTRODUCTION

Massive Open Online Courses (MOOC) is a model of educational delivery that is, to varying degrees, *massive*, with theoretically no limit to enrollment; *open*, allowing anyone to participate, usually at no cost; *online*, with learning activities typically taking place over the web; and a *course*, structured around a set of learning goals in a defined area of study.

The MOOC movement has arisen to provide access to high quality education to the remote corners of the United States and the world [1]. MOOCs are at such an early stage of development that there is not yet an agreed or preferred way to describe their approach [2].

Two types of MOOCs are now commonly discussed. The first is based on the connectivism theory of learning, which favors networks of learners evolving informally. These are known as cMOOCs. The type known as xMOOCs are more traditional, content based, and more closely resemble traditional educational models. Content based, xMOOC is more likely to have one or several lecturers, usually delivering lectures via YouTube style videos, with tasks and discussions taking place online via proprietary software. This organization allows the university to incorporate the MOOC into the existing curricula. Deadlines for completing tasks and an online form of continuous assessment allow the course administrators to assign marks and credits. Online participants who are not interested in obtaining credits can participate, or not as they wish.

II. MOOCs BACKGROUND

The term MOOC was first used in 2008 to describe a course offered in Canada in which the enrolment was opened online to anyone, and more than 2000 people signed up for the course. The only difference was that the online participants wouldn't receive credit, whereas the university students would. A similar online course on artificial intelligence offered by Stanford was opened in 2011 and close to a quarter million people signed up for it.

The notoriety of this and similar examples prompted a debate in the media and educational journals about the latest future of education. Universities rushed to put as much of their courses online, for free. The results now range from standard e-learning courses which are opened to the public, to for profit corporations working in conjunction with universities to create proprietary systems for delivering courses. The most basic characteristic of a MOOC is that it is online, and it is free. A huge variety of courses now exist that begin with those parameters.

MOOCs are, perhaps, the first instances of Web-based educational technology to step into that second stage. They create something native to the Web that takes advantage of what the Web can do, rather than simply trying to mimic a classroom virtually. MOOCs might be the first truly Web-native form of teaching and learning [3].

In 2012, another MOOC experiment caught academics' attention. Two Stanford Professors Sebastian Thrun and Peter Norvig decided to offer "Introduction to Artificial Intelligence" for free online. Designed to resemble real classroom experiences and offer high-quality classes for everyone, the idea had the advantage of carrying the prestigious Stanford name [4]. "Introduction to Artificial Intelligence" MOOC gathered more than 160,000



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students in 190 countries; this course was truly ‘massive’. This experience motivate Thrun and Norvig to build a new business model for online learning, the start-up Udacity.

One year later, two more American start-ups for MOOCs appeared: Coursera and EdX. In 2013, many universities build their own MOOC platform. And there are many other independent MOOC initiatives appearing, including Open2Study in Australia, FUN in France and Iversity in Germany. With different goals, what they have in common is the connection between learners and teachers [4].

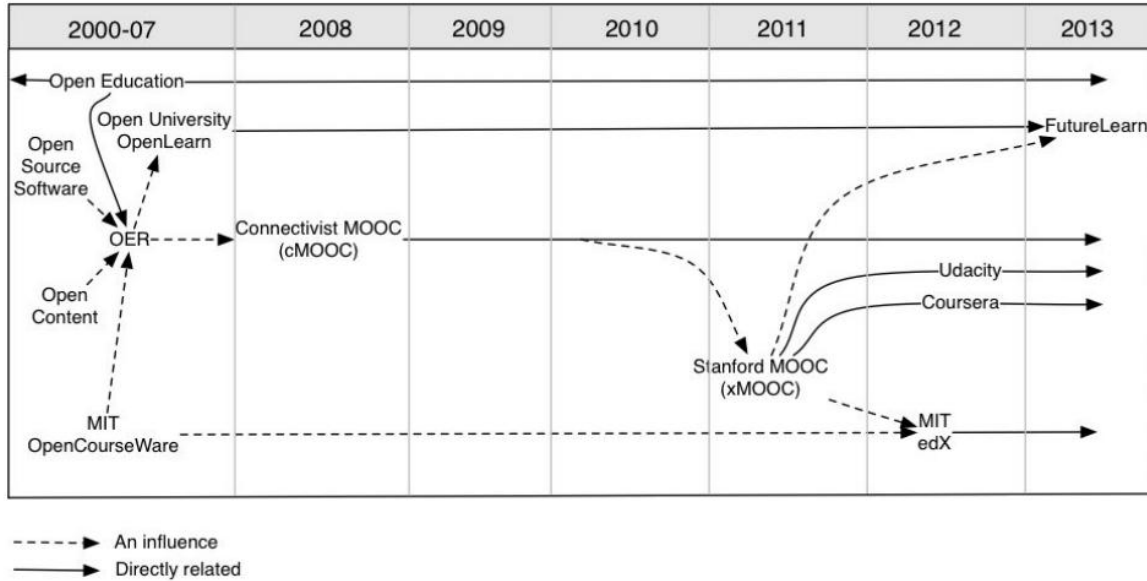


Fig.1.MOOCs and Open Education Timeline [5]

III. THE EIGHT STEPS APPROACH TO CREATE A MOOC

Our approach to create a MOOC is based on Interactive Multimedia Learning System (IMLS), the approach studies implies that it is important to design as much meaningful interactivity as possible [6]-[7]. The architecture of an IMLS is based on four main pillars: communication, semiotics, learning and systemic educational technology. The following table summarizes the producing process of Interactive Multimedia Learning System.

- A. The first step:** requirements analysis, this step consists in the definition of a number of parameters related to the course:
- Intended audience.
 - Learning objectives.
 - Scriptwriting the course.
 - Tools and technologies that will be used.
 - Managing legal aspects.

The entire design of the course, from content to language, teaching strategies to assessment, should be designed according to the needs and prior knowledge of our primary audience. For Perspectives on Disability, we’ll design the course for individuals with little or no prior knowledge of the content, and for participants from middle school through adulthood. This meant we’ll kept the language simple, included introductory-level content, and provided a variety of assessment methods that would appeal to a wide audience. It is important to remember that in many MOOCs a substantial percentage of participants are from outside of the Faculty, and so English may not be their native language. Age, educational background, and prior knowledge may also vary among MOOC participants. MOOCs require caution regarding legal concerns, particularly copyright of any materials created for the MOOC or used from other sources and the privacy of student data and contributions. These concerns are just the beginning, however. It is important to be aware of the many legal issues that impact MOOCs.



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	Steps	Operations
Planification (preliminary study)	Subjects data Consignment	Needs
	Content precision	Population
	Defining objectifs	Parts and elements
	Contents structuring Estimations :Timetable,budget	General and specific objectifs
Conception	Learning strategy	Elements sequencies and orders
	Pedagogic integration	Ressources methods messages
	System design	Pedagogic factors
Development	Design implementation	Steps links organigrams achitektur
	Messages display	Parts links relations
	Pedagogic integration	Signs signfication
Evaluation	Instruments implementation	Activities factors interactivity
	Conditions and modalities	QuizInterview obseravation
	Testing	Place schedule responsablities
	Analysis and processing of results	Presentation progress
	Proposed corrections	Recomendations
Adjustment	Indicated adjustments	Modifications corrections
	Verification	Testing results

Table. I. Steps of producing process of Interactive Multimedia Learning Systems

B. The second step: team recruitment

- A pedagogical responsible, for the selection or creation of educational content.
- A project leader, which ensures the proper conduct of the course.
- A community manager, responsible for communication with participant, and the evaluation of the MOOC after its launching.

A person can play several roles when it is not possible to hire a full team.

C. The third step: conception

- Conception of teaching resources; course videos, homework, activities.
- Conception of accompanying resources; tutorials for used tools, explanation of how we can operate with the course.
- Conception of communication materials necessary for the recruitment campaign.



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This seems obvious design a course from the student's perspective, yet it's an atypical approach. When designing a web page for a course site, always ask 'how will this look to the student'? Anyone involved in online course design needs to take an online course as a student. Completing at least one week of course work in a MOOC, gives one an entirely different perspective on course design.

Effective use of white space emphasizes key concepts, improves comprehension (up to 20%) and reduces cognitive overload [8]. White space is the part of a web page that is left blank or unmarked. It's the (white) space between columns, text, images, and margins on the page. This space provides visual relief to the reader and improves readability. Avoid using big blocks of text. Break it up with a graphic, or block of white space or increased line space.

D. The fourth step: platform choice

A MOOC platform is a web-based system that provides courses and associated services to learners and need to be prepared to receive massive amounts of enrolments. It can be based on a single site on the web (xMOOC) or be distributed among several sites/services (cMOOC).

A MOOC provider is an organization that accepts and selects contributions for open courses from Universities and makes them available for learner enrollment and participation. Often, providers develop their own platforms, emphasizing their features as a means to attract authors and learners. In addition to traditional learning management systems. MOOC platforms provide novel features, such karma points, badges (certificates for completing certain learning modules), and communication tools. Most MOOCs offer additional, usually paid online and offline services, such as tutoring, course materials, and formal certification.

During the conception step the project leader or a technical expert can use a blog, a wiki, or a closed (Blackboard, Coursera, Coursesites, edX, Udacity) or semi closed system (Moodle) and performs the necessary settings to fix the chosen platform.

Asynchronous and Synchronous: since MOOCs are open and free, they attract masses from around the globe. The content and interactions with the instructor and the other participants should be available 24/7. In addition, there's value in having live online classes and not just video recordings. Students will find the interacting in the chat box of a live online class or webinar

E. The fifth step: test

When the course is ready, it is better to organize a test with a reduced number of students, to identify the problems that will arise throughout the MOOC.

F. The sixth step: MOOC launching

Teaching resources are available, homework and activities begin. The teaching staff must drive the course for several weeks in a row.

G. The seven step: MOOC conduct

The animation of social networks, forums and live events is the responsibility of the community manager, while the project leader and pedagogical responsible respectively occupy organizational problems.

H. The last step: MOOC reviewing

The course is completed; the work of the teaching staff is not finished. It is necessary to review the data and all information provided by the MOOC.

The evaluation of online courses involves many of the same criteria applied to traditional classroom courses but also necessitates the use of new criteria more directly based on the online environment. The course evaluation materials below offer a range of rubrics and guidelines for help in developing effective practices for evaluating online courses.

As MOOCs are still evolving, different approaches to assessing their quality and effectiveness continue to adapt. We propose in our paper an approach based on four ways to evaluate Massive Open Online Courses (MOOCs):



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- As an eLearning Course: Depending on the structure and organization of the MOOC, one may be able to assess it as any other eLearning course. This would only work if the MOOC has set goals, objectives and learning outcomes. The MOOC can then be assessed with one of the established online course evaluation rubrics such as the 'Quality Online Course Initiative Rubric' by the Illinois Online Network.
- By the Process Perspective: Stephen Downes proposes two approaches to evaluating MOOCs [9], both of which assess these courses as networks. The first method is referred to as the 'process perspective' whereby the MOOC is evaluated by the criteria of successful networks (autonomy, diversity, openness, interactivity).
- Via the Outcomes Perspective: The second method that Downes proposes is the 'outcomes perspective'. In this approach MOOCs are evaluated as knowing systems; as entities which learn as a whole. MOOC effectiveness is then based on the system's success and not on individual participant outcomes. Both of Downes' approaches are very interesting and deserve more thought and exploration.
- By Self-Assessment: Some MOOCs are experimenting in using self-assessment to evaluate student progress. However, this type of evaluation only examines participant learning and not the quality of the course or the teaching approach. With MOOCs not establishing learning goals and with students creating their own, the evaluation process becomes even more complex. Another factor to consider is that relying solely on self-assessment can lead to inaccurate and unreliable results.

IV. DISCUSSION

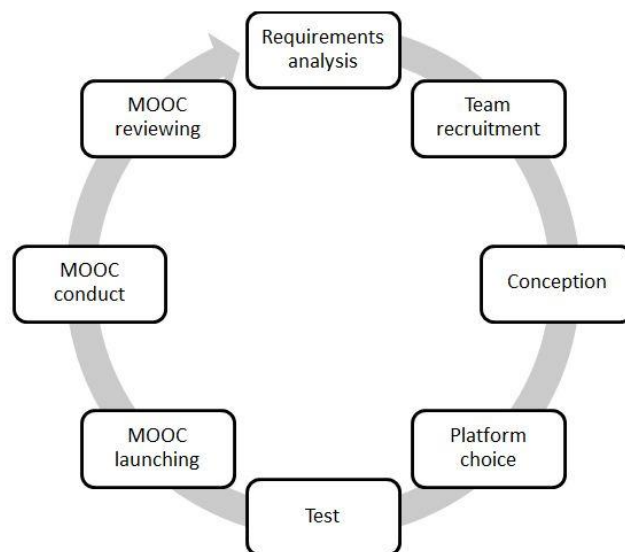


Fig.2.Eight steps approach to create a MOOC

“Figure.2” Summarizes the eight steps presented in this paper. To create a MOOC we propose starting by requirements analysis then team requirement and the step of conception which will lead us to the stage of platform choice and then we will proceed with testing the courses. After the test we will go through the MOOC launching and conduct phase, and finally a reviewing step is necessary to validate the whole process of our work.

MOOCs have sparked an intense new debate about the role of technology in shaping higher education. As open online learning spaces, these courses have the potential to open access to new skills and knowledge to large numbers of students. Yet, there are inherent challenges in trying to automate instruction for an unlimited audience.

V. CONCLUSIONS AND FUTURE WORK

In this paper we presented the eight steps approach to create a MOOC based on Interactive Multimedia Learning System (IMLS). One of the major potential fields of interests in the use of MOOCs is precisely Physics, due to that



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we developed a physics course using the steps presented in this work to test and validate each one of them in a concrete learning situation. Next step is to optimize this approach.

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