# Proposed Model for Using Open Educational Resources in Massive Open Online Courses (MOOCs)

Ahmed Hosny Saleh Metwally

School of Computer Science and Information Technology
Northeast Normal University
Changchun, China
E-mail: ahmed_hosny@nenu.edu.cn

Wang Yining

School of Media Science
Northeast Normal University
Changchun, China
E-mail: Wangyn814@nenu.edu.cn

*Abstract*— **One of the most important events of the last few years was the propagation of Massive Open Online Courses (MOOCs). Indeed, MOOCs have managed to help huge numbers of online users, especially in higher education sector, to attend free courses and get certificates. Open Educational Resources (OERs) can be used in different ways in the learning practices because the concept of openness and reusability of these resources encourages many stakeholders to use these resources in online and massive courses. The main challenge faced by many experiments in using OERs in MOOCs is how to enhance interaction between students and educational content. Thus, there is an urgent need to address this challenge by building and maintaining links between these kinds of courses and the provided OERs by other universities. The specific objective of this paper was to propose a model for using OERs through the current MOOCs. Data for this study were collected by reviewing previous related work and models to present this model in three main Phases: Pre-using OERs, Using OERs, and sustaining of OERs. Every Phase includes attributes and components. This proposed model can be implemented when designers and developers of MOOCs intend to invest different open educational resources in engaging participants and exchange best learning practices.**

*Keywords-Massive Open Online Courses; MOOCs; Open Educational Resources; OERs; Model.*

## I. INTRODUCTION

Recently, there has been renewed interest in the development and use of Open Education Resources (OER) and their potential in expanding access to higher education and improving the quality of course contents, particularly in the education domain, where there is a wide range of quality materials [1]. From official education materials such as the ones available in Massive Open Online Courses (MOOC), Higher Education domain is becoming critical to recognize that relationship between OERs and MOOCs [1].

In the light of elevating the meaning of educational resources, "OERs can be described as the five Rs of openness [2]:
• Retain—the right to make, own, and control copies of the content.

• Reuse—the right to use the content in a wide range of ways (e.g., in a class, in a study group, on a website, and in a video).
• Revise—the right to adapt, adjust, modify, or alter the content (e.g., translate the content into another language)
• Remix—the right to combine the original or revised content with other open content to create something new (e.g., incorporate the content into a "mashup").
• Redistribute—the right to share copies of the original content, revisions, or remixes with others (e.g., give a copy of the content to a friend)."
OERs "typically refer to electronic resources, and such materials are generally released under a Creative Commons or similar license that, can originate from colleges and universities, libraries, archival organizations, government agencies, commercial organizations or other individuals who develop educational resources they are willing to share" [3].

Despite the long history of OERs and its occupation high agenda of social and inclusion policies and supported by many stakeholders in education, their use has not yet reached a critical threshold, basically, the current concern on OER is on building more access to digital content [4].

MOOCs are free of charge courses for a massive number of learners on the web; it must be considered that course design and the way of presenting course materials, and interactivity trough social networks and study groups [5]. Learners must be self-organizer to participate in mutual interest subjects with other learners; massive courses have weekly timetable, no special prerequisites should be provided, no formal certification will be awarded [6].

In the context of OERs and MOOCs, for example, the course about Open Educational Resources (COER13) has been completely downloaded and re-uploaded to iMooX, The course was republished with some new videos and interviews for more than 500 users, so reusing and remixing allows for the reoffering of courses without additional costs [7]. Moreover, extensive research has shown that a cost efficient way and introduced OER at the Medical University of Graz which can be applied also to other institutions so the following steps are performed: (1) Identify the need, (2)

Identification of content which may be suitable also for general public, (3) Rights clearance, (4) Set-up of distribution channels [8].

MOOCs that implement OER practices implement the ethical dimension of e-learning much more successfully than MOOCs that might just offer free access to a MOOC at a given time or use proprietary resources that cannot be reused [9]; for example, in xMOOCs the course materials are provided during the course time, in some cases cannot be reused [9].

Ghislandi sees that "the main problem is how to implement Openness for achieving best learning results, provided that the OER and MOOC evaluation is still a fluid topic" [10]. The course materials in the majority of MOOCs are not designed to fit the concept of the OER movement, and protected under copyright regulations which do not allow adaptation or translation; therefore, the content con not be reused; since they are nonmodifiable, nonremixable, nonshareable [11][12].

Atenas recommended that "the fairest way to allow and encourage the use of resources from MOOCs is by removing copyright barriers, adding creative commons licenses to course materials and by using the General Public License (GNU) in the case of open codes used for modeling the contents or courses" [12]. This way may enforce sharing and reusing resources but it needs more awareness with related issues like ethical issues and quality assurance.

This research attempts to make explicit a systematic relationship between MOOCs and Open Educational Resources through proposing a model for using and implementing OERs in MOOCs. The rest of this research is organized as follows: Section II. OER vs. MOOC; Section III. Quality Approach; Section IV. Provide details of the proposed model for using OERs in MOOCs. Section V. Presents the findings of the research, focusing on the three key themes that connect using OERs in MOOCs; Section VI Taken together, these findings and highlighted new research tracks.

## II.    OER VS. MOOC

This section reviews and compares the main themes between OER and MOOCs [10]:

- "OER is a resource, and sometimes a course. MOOCs are courses including assessment, credits system, students support, curriculum, etc.
- OER is typically delivered on demand while MOOCs have a defined beginning and end.
- OER can be used by a single person while MOOCs are addressed to a massive cohort, during a given period.
- OER is for every school level while MOOCs are mainly dedicated to Higher Education and the Life Long Learning postgraduate or nonformal".

The term of "open" in MOOC refers to "open admissions" or the removal of any academic barriers to participation in a course or program[13]. While the term of "open" in OER entails, "it seems, at a minimum, no cost to the consumer or user of the resource" [14].

Although differences between OER and MOOCs are mentioned, it can be noted that approaches consider MOOCs as open resources. OER used for teaching, assessment, research purpose so it is supposed using and implementing these resources to formulate and construct massive courses.

## III.    QUALITY APPROACH

Developing and using OERs makes improvement in the quality of education when the teachers and students use the educational resources without barriers like copyright and paying barriers [15]. Moreover, OERs and MOOCs provide different opportunities for achieving quality in higher education through implementing strategic management approach [16].

The quality of instructional design of a massive course is a critical indicator and prerequisite of the potential of the course for effective learning.

There are quality standards and rubrics have focused significantly on the quality of OERs and MOOCs. Camilleri, Ehlers, Pawlowski figured out that "quality assurance requires pedagogical enhancement, pedagogical stakeholders, and pedagogical resources" [4]. Furthermore, open standards for quality assurance of OER and MOOC would assist in measuring quality in more globally accepted terms [11].



Figure 1. Quality indicators for OERs and MOOCs.

As shown in Figure 1. "accessibility, flexibility, interactivity, personalization, transparency, open and shared content, use of media, pedagogical enhancement, reflection, and social learning are the key indicators of high quality in the use of OERs and MOOCs" [16].

## IV.    PROPOSED MODEL FOR USING OERS IN MOOCS

This section presents the proposed model for using OERs in MOOCs. This model has formed through reviewing previous works and models in this domain like:

potential model to guide the development of OER in public health and help an academic for producing and publishing OER through a matrix of questions and answers, according to various risks and benefits to them and their institution [17]. Another framework based on semantic web technologies to improve discovery, accessibility, visibility, and to promote reuse of open educational content in the massive course [18]. Moreover, Atenas' study proposed model for democratisation of the contents hosted in MOOCs through three strategies to open up MOOC contents includes: "deposit the materials in repositories of OER (ROER) as individual objects, to archive them in ROER in data packages as learning units or to convert them into Open Courseware (OCW) as self-taught courses" [12]. Furthermore, Shu-Hsiang, Jaitip, and Ana developed "a strategic planning process (SPP) model based on the concept of open educational resources, university social responsibility (USR), social entrepreneurship (SE), and strategic planning (SP), so the proposed SPP model will serve as a guide for mapping out a strategic plan and activities for aligning and implementing OER, which can tie strategic planning to a university's effectiveness and success in sustainability for the long term" [19].

It can be noted that the proposed model in this research has included three Phases as the following:

A.  *Phase 1: Pre-Using OERs*

B.  *Phase 2: Using OERs*

C.  *Phase 3: Sustaining of OERs*

As shown in Figure 2. Proposed model contains three main phases for using OER in MOOCs.

A. *Phase 1: Pre-Using OERs:*

This Phase includes finding OERs through searching on the web by search engines to collect and download these resources in different formats. Also, MOOCs provider can provide other resources from previous educational softwares that produced before, repositories, open coursewares, and online courses. After collecting resources they can archive its.

B. *Phase 2: Using OERs:*

MOOCs platforms may provide a course in different subjects so MOOCs providers have to produce OERs if they found that the resources in phase (1) need to modify for serving the educational objectives or even producing OERs by authoring tools. Web 2.0 has provided effective tools for creating OERs so it will encourage authoring and producing many resources as well. In all cases, Creative Common License can be used to keep intellectual property rights and empower the concept of openness and reuse.

Repository in MOOC platform has great importance in this proposed model. It receives all of the resources either which are collected in the previous phase or produce in this phase. On the other hand, repository connects producing process with using process and encourages users' contributions by uploading their own resources and downloading other ones or even embed them through using embed codes. These activities for users could translate to points so it can be shown in their profile to reinforce sharing OERs.
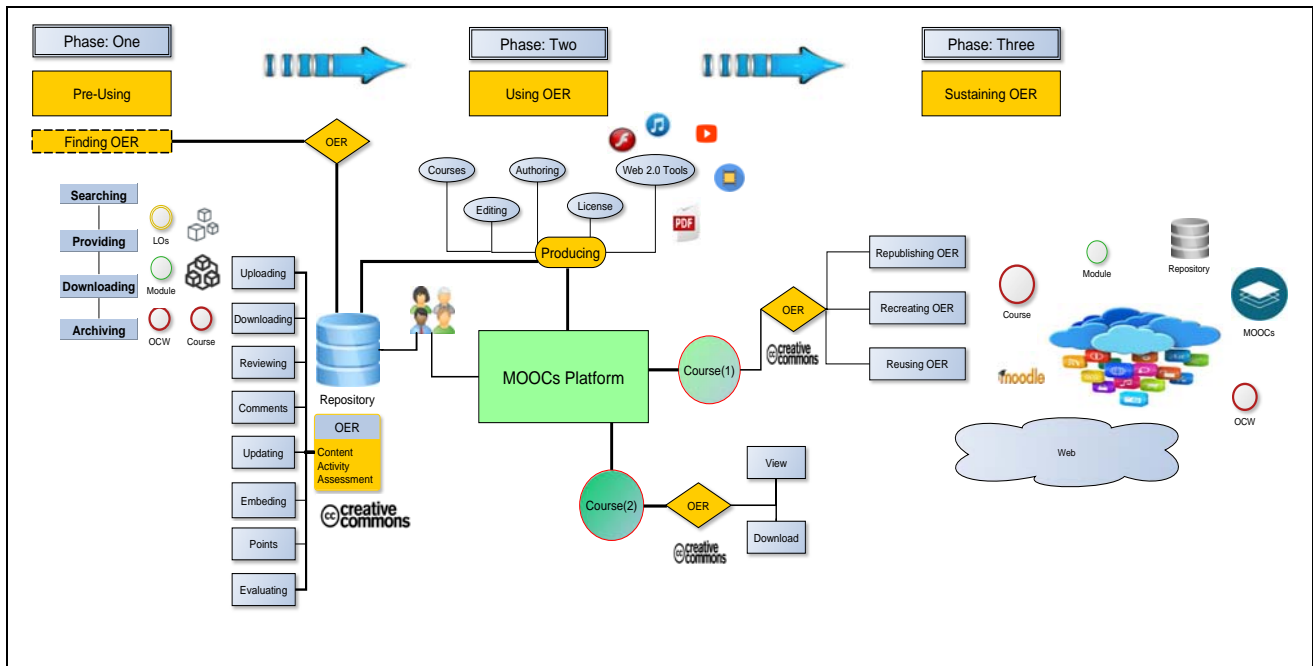


Figure 2. Proposed model for using OERs in MOOCs.

MOOCs providers and Users can evaluate OERs in repository in the light of quality standards. Repository supervisors can review new resources, update some of them, add comments. Registered users in MOOCs preview courses and resources for free.

*C. Phase 3: Sustaining OERs:*

In this phase, MOOCs providers have to come up with in the ways of supporting OERs, reusing, and sustaining. This may happen by creative commons license that helps users of MOOCs to reuse and share OERs which have been used in MOOCs. Furthermore, OERs will be available after studying courses on the web for reusing in other courses, republishing in another contexts through Learning management systems, Open course wares, learning objects repository, educational Softwares.

## V. RELATED ISSUES FOR CONNECTING AND USING OERS IN MOOCS

The following part presents the findings of the research, focusing on the related issues that connect using OERs in MOOCs as it shows in Figure 3.

- Learning communities: support developing OERs that mainly used in MOOCs. being OERs in a social context that leads to developing and update content over time [20].
- Sustainability: it relates to financial issues and paying for getting certificates may be a good solution to keep sustaining OERs besides thinking of emerging business models.
- Quality Assurance: it must be taken into consideration for quality of MOOCs and OERs if we need to raise learning quality and learning outcomes.
- Legal Issues: and raising awareness about types of Licenses and consequences of using illegal resources.

- Trust and Reputation: if MOOCs providers need to gain a high reputation for courses, they have to give more concerns with the trust of OERs and search for good methods to keep the trust of users.
- Interoperability: that means designing OERs to be compatible with different MOOCs platforms, learning environments and standards.
- Instructional Design: It is a basic component of the overall quality and pedagogic effectiveness of learning practices [21]. Instructional Designer must implement models for developing massive courses and create educational resources in a systematic way upon educational approach.
- OER Distribution: after studying massive course and a possibility of reusing OERs in another course.
- Creative OER: crating educational resources is very important but not enough to keep using. Achieving a high level of learning objectives requires creative resources in their content, activity, assessment of these resources. The more producing creative OERs, the more using OERs.
- Ethical Issues: have a relationship with legal issues and the degree of awareness about authors copyrights; either OERs used for educational purpose or research purpose.
- MOOC and OER Models: designing and developing models in the field of MOOCs and OERs contributes in an effective way to discuss the main attributes which have main importance for encouraging implementing OERs in MOOCs.
- Learning Analytics: will help in recognizing to which extent stakeholders used OERs in massive courses. It leads to design and renews strategies for efficient use.
- Technical Issues: in the light of quality standards of both of OERs and MOOCs.
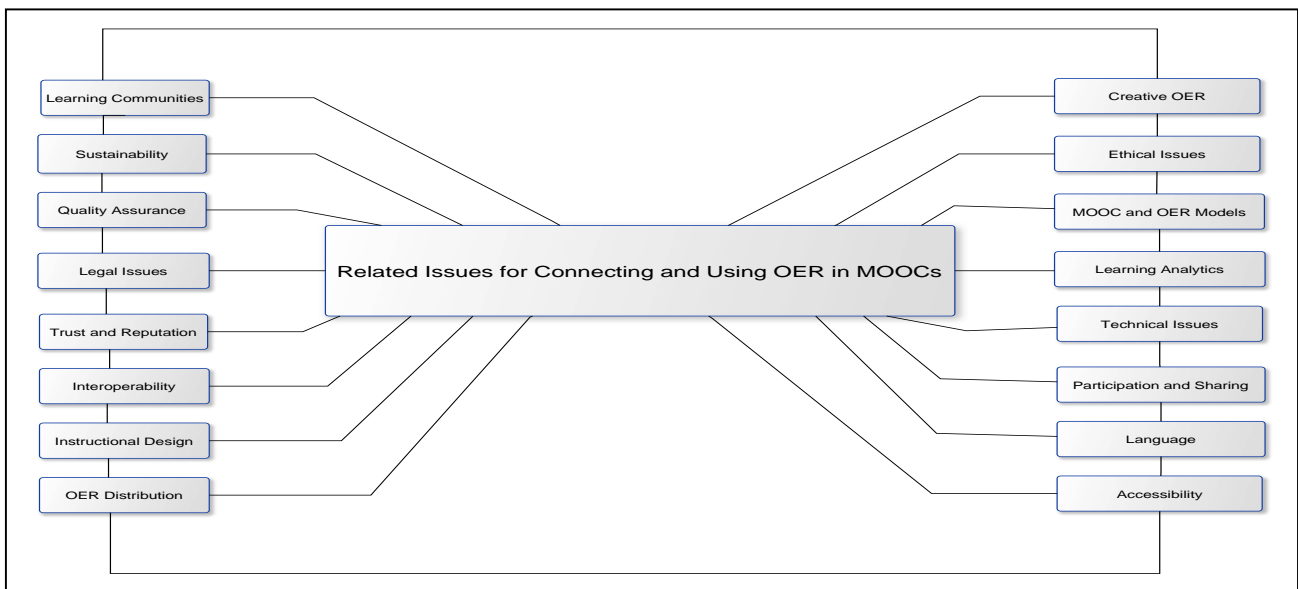


Figure 3. Related Issues for connecting and using OERs in MOOCs.

- Participation and Sharing: for maximizing benefits from OERs and providing tools in MOOCs platform to share, publish, and upload resources by users.
- Language: it may cause troubles especially to non-English speaker countries, so there is a need to find the best ways to use OERs in other languages.
- Accessibility: and providing resources for disabilities users and special needs, and developing accessibility standards to be compatible to fit their needs.

## VI. CONCLUSION AND FUTURE WORK

In general, therefore, it seems that MOOCs and OERs concepts include common features such as openness and serving educational purposes. Although the expansion of creating and sharing OERs on the web, there are researches study strategies and recommendations in the context of implementing OERs and MOOCs for achieving best educational practices. This research has addressed connecting between OERs and MOOCs through proposing a model for using OERs in MOOCs which included three phases: Pre-Using OERs, Using OERs, and Sustaining OERs. Every phase contained attributions started from finding OERs passing to preparing, and conserving these resources through the repository and distributing its. There are important factors to encourage users to share educational resources like providing repository in MOOCs platform with a point system, and allow them to evaluate resources with repository's evaluator. Sustaining OERs could be done by paying for getting a certificate to support costs of producing OERs. Last but not least, research has presented the finding focusing on the related issues for connecting open educational resources and massive open online courses: Learning communities, Sustainability, Quality Assurance, Legal Issues, Trust and Reputation, Interoperability, Instructional Design, OER Distribution, Creative OER, Ethical Issues, MOOC and OER Models, Learning Analytics, Technical Issues, Participation and Sharing, Language, Accessibility. Considering the findings of this research may direct future research, it would be desirable to develop a prototype of the proposed model. Further into the future, Studying related factors of using OERs when applying the proposed model will encourage using OERs in the massive courses. Furthermore, studying the criteria of using OERs in MOOCs, and applying qualitative research for studying the rates of using OERs in MOOCs could be important research directions in the future.

## ACKNOWLEDGMENT

This research is supported by Northeast Normal University. Special thanks to the research team in educational technology seminar, and school of computer science and information technology at Northeast Normal University.

## REFERENCES

[1] A. M. F. Yousef, M. A. Chatti, M. Wosnitza, and U. Schroeder, "A Review of the State-of-the-Art," in *Proceedings of CSEDU2014, 6th International Conference on Computer Supported Education*, 2014, pp. 9–20.

[2] D. wiley, "The Access Compromise and the 5th R," 2014. [Online]. Available: http://opencontent.org/blog/archives/3221. [retrieved: January, 2017].

[3] EDUCAUSE, "7 things you should know about Open Educational Resources," *EDUCAUSE Learning Initiative*, pp. 1–2, 2010. [Online]. Available: http://net.educause.edu/ir/library/pdf/ELi7061.pdf. [retrieved: February, 2017].

[4] A. F. Camilleri, U. D. Ehlers, and J. Pawlowski, "State of the Art Review of Quality Issues related to Open Educational Resources (OER)," JRC Scientific and Policy Reports, Publications Office of the European Union, Luxembourg, Rep. EUR 26624 EN, 2014.

[5] L. Pappano, "The Year of the MOOC," *The New York Times*, 2012.[Online].Available: http://www.nytimes.com/2012/11/04/education/edlife/massive-open-online-courses-are-multiplying-at-a-rapid-pace.html. [retrieved: January, 2017].

[6] A. Mcauley, B. Stewart, G. Siemens, and D. Cormier, "The MOOC Model for Digital Practice," 2010. [Online]. Available: http://www.elearnspace.org/Articles/MOOC_Final.pdf. [retrieved: February, 2017].

[7] M. Ebner et al., "How OER Enhances MOOCs—A Perspective from German-Speaking Europe," in *Open Education: from OERs to MOOCs*, no. August, J. M, Kinshuk, and M. K. Khribi, Eds. Berlin, Heidelberg: Springer Berlin Heidelberg 2017, pp. 205–220.

[8] H. Rehatschek, U. Leopold, and S. Kerschbaumer, "Introduction of OER at the Medical University of Graz: Practical tips to introduce OER with a minimum of additional budget and efforts," in. *International Conference on Interactive Collaborative Learning (ICL)*, Dubai, 2014, pp. 121-126.

[9] P. Arnold, S. Kumar, S. Schön, M, Ebner, and A. Thillosen, "A MOOC on Open Educational Resources as an Open Educational Resource : COER13," in The MOOC Case Book: *Case Studies in MOOC Design, Development and Implementation*, J.R, Corbeil, M.E, Corbeil, and B.H, Khan, Eds. NY: Linus Learning, pp. 247-258.

[10] P. Ghislandi, "A tale about Zen philosophy and a motorcycle. (that is: OER & MOOC quality)," *Research on Education and Media*, vol. 7, no. 1, P.P.-, 2015.

[11] I. F. Silveira, "OER and MOOC: The need for openness," *Issues Informing Sci. Inf. Technol.*, vol. 13, pp. 209–223, 2016..

[12] J. Atenas, "Model for democratisation of the contents hosted in MOOCs," *RUSC. Universities and Knowledge Society Journal*, vol. 12, no. 1. pp. 3–14.

[13] S. Downes, "The quality of massive open online courses," in *International Handbook of E-Learning, Volume 1: Theoretical perspectives and research*, B. H. Khan and M. Ally, Eds. 2015, pp. 65–77.

[14] S. Downes, "Models for Sustainable Open Educational Resources," *Interdisciplinary journal of knowledge and learning objects*, vol. 3, no. 1, pp. 29–44, 2007.

**Copyright (c) IARIA, 2017.    ISBN:  978-1-61208-541-8**                                                                 **113**

[15] C. R. Wright and S. A. Reju, "Developing and Deploying OERs in sub-Saharan Africa: Building on the present," *Int. Rev. Res. Open Distance Learn.*, vol. 13, no. 2, pp. 181–220, 2012.

[16] E. Ossiannilsson, Z. Altinay, and F. Altinay, "Towards Fostering Quality in Open Online Education Through OER and MOOC Practices," in *Open Education: from OERs to MOOCs*, M. Jemni, Kinshuk, and M. K. Khribi, Eds. Berlin, Heidelberg: Springer Berlin Heidelberg, 2017, pp. 189–204.

[17] A. Hemingway, C. Angell, H. Hartwell, and R. F. Heller, "An emerging model for publishing and using open educational resources in public health," *Perspect. Public Health*, vol. 131, no. 1, pp. 38–43, 2011.

[18] N. Piedra, J. Chicaiza, J. López, and E. Tovar Caro, "Supporting openness of MOOCs contents through of an OER and OCW framework based on Linked Data technologies," in *2014 IEEE Global Engineering Education Conference (EDUCON)*. April 2014, pp. 1112–1117.

[19] C. Shu-Hsiang, N. Jaitip, and D. J. Ana, "From Vision to Action – A Strategic Planning Process Model for Open Educational Resources," P*rocedia-Social and Behavioral Sciences*, vol. 174, pp. 3707–3714, 2015.

[20] N. Sclater, "MOOCs, Open educational resources and social networking: bridging the gap between informal and formal learning," *Revista Mediterránea de Comunicación*, vol. 7, no. 2, pp. 9–19, 2016.

[21] A. Margaryan, M. Bianco, and A. Littlejohn, "Instructional Quality of Massive Open Online Courses (MOOCs)," *Computer & Education.*, vol. 80, pp. 77–83, Aug. 2015.