QALAAI ZANIST JOURNAL
A Scientific Quarterly Refereed Journal Issued by Lebanese French University – Erbil – Kurdistan – Iraq
Vol. (2), No. (2), April 2017
Speical Issue : The 1st International Conference on Information Technology (ICoIT'17)
ISSN 2518-6566 (Online) - ISSN 2518-6558 (Print)

Design and Development of a MOOC for Academic Institution in Iraq

Inas Ismail Imran
Amer S. Elameer
Rafah Al-Hamdani
The Informatics Institute for Postgraduate Studies

ARTICLE INFO

Article History:
Received: 20 March 2017
Accepted: 1 April 2017
Published: 10 April 2017
DOI:
10.25212/lfu.qzj.2.2.18

Keywords: **:** *MOOC, E-learning, programming languages (PHP7, MySQL, JavaScript), HTML and CSS languages, Tools and Technique of MOOCs.*

ABSTRACT

Massive Open Online Courses, shortly MOOCs, are a phenomenon in online education nowadays because it supports teaching and learning processes in academic institutions. Therefore In this paper a new design of MOOC website have been developed for Iraqi academic institution; specifically for Informatics Institute of Higher Studies. The new website is designed and implemented as an interactive educational platform using PHP7 scripting language (back end code that control front end logic), MySQL to build the database, HTML language used to design the layout of website, CSS language is used to add style to the web page finally JavaScript programming language is also used to add dynamic elements and action to the web page. The result of the project is to establish MOOC website based on the general curriculum provided by the Iraqi ministry of higher education to spread usage of E-learning in Iraq and also establish the first E-Iraqi University.

1. INTRODUCTION

E-learning is one of self- learning patterns in which the individual learns via computer, smartphone, tablets, and the Internet [1]. E-learning provides almost no hindrances for self-learning as long as all the requirements are available, therefore this method became well-known among those who desire to learn via Educational technology, hence this method is considered as an important part of society today. One of the well-known terms of E-learning is MOOC system [2].

MOOC term is an abbreviation of Massive Open Online Courses, which represent a recognized model of self-learning. It is considered as one of the most developed, modernized methods and the latest evolution of an open education resources [3]. It is an educational courses and curricula prepared by accredited Universities and educational institutions [4, 5], moreover; it is free and open on the Internet. MOOC have interesting features which include feedback, homework assignments, evaluation, testing, and certification [6].

MOOC has developed a high-quality educational system which is accessible to the masses over the world, therefore many educational experts and technologists predicted that it will change the patterns of traditional education methods in the near future [12].

Now, international organizations and UNESCO adopt these types of learning and supports these trends. Although new, adopting such system proved to have a high potential to direct

QALAAI ZANIST JOURNAL
A Scientific Quarterly Refereed Journal Issued by Lebanese French University – Erbil – Kurdistan – Iraq
Vol. (2), No. (2), April 2017
Speical Issue : The 1st International Conference on Information Technology (ICoIT'17)
ISSN 2518-6566 (Online) - ISSN 2518-6558 (Print)

the society towards knowledge, increasing growth of learning in the world, and promoting the concept of lifelong learning [13].

Recent researches and articles showed that MOOC usage had spread all over the world, hence MOOC is considered as a huge opportunity for learners to increase their knowledge and experience in various fields [14].

MOOC encourages the exchange of knowledge, ideas and information among the learners and teachers therefore it contribute to the enrichment of an open educational environment [15]. Therefore In this paper a new design of MOOC website have been developed for Iraqi academic institution; specifically for Informatics Institute of Higher Studies to spread usage of E-learning in Iraq and also to establish the first E-Iraqi University.

2. DEFINITION OF MOOCS

Different definitions have been offered for the term MOOC by illustrating the four words in the MOOC abbreviation. The key components of MOOCs are shown in **Figure (1**) [16]**:**

1. Massive: massiveness in MOOCs refers to the number of course participants. Whereas most of the MOOCs had a hundred participants so that some courses reached over 150,000 registrations. Massive reflects the capacity of the course to expand to huge numbers of learners. The challenge is to find the correct balance between a large number of participants, individual needs of learners and content quality [17].
2. Open: Openness consist of four dimensions (4Rs) Reuse, Revise, Remix, and Redistribute. In the terms of MOOCs, it refers to providing a learning experience to a large number of participants around the world regardless of their location, age and level of education, without any requirement meaning no course fees to access high-quality education, also openness can refer to providing open educational resources (OER) e.g. course notes, video lectures, PowerPoint presentations, and assessment [18].
3. Online: In MOOCs, the term online refers to the accessibility of these courses from every spot of the world via the internet connection to provide synchronous and asynchronous interaction between the course participants. In some types of MOOCs example (blended MOOCs), learners can learn in part face-to-face as well as the online interaction possibilities [19].
4. Courses: The term course in higher education is defined as a unit of teaching. In MOOCs, it refers to the academic curriculum to be delivered to the learners,
   Including OER, learning objectives, networking tools, and assessments [20].

QALAAI ZANIST JOURNAL
A Scientific Quarterly Refereed Journal Issued by Lebanese French University – Erbil – Kurdistan – Iraq
Vol. (2), No. (2), April 2017
Speical Issue : The 1st International Conference on Information Technology (ICoIT'17)
ISSN 2518-6566 (Online) - ISSN 2518-6558 (Print)

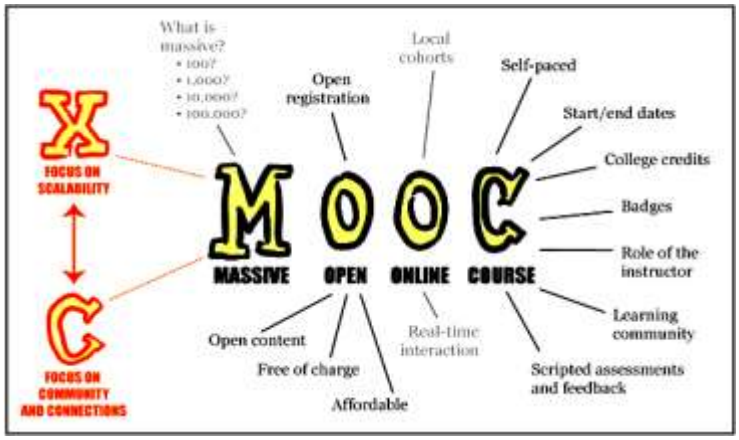

Figure (1): Abbreviation of MOOC (Massive Open Online Courses).

3.COMPONENTS OF MOOC

MOOCs are the definition of dynamic social learning. It provides for participants the opportunity to interact, connect and engage with others all over the world. MOOCs are interactive and use quizzes ,assignments, and tests, moreover, videos blogs, wikis, Facebook pages, twitter and forums to participate with students. Every MOOC course has a syllabus that lists the learning goals and defines the scope of the topics accompanying with discussions, assignments, and quizzes or tests [21]. The syllabus also consist of a weekly schedule specifically for assignment submissions. The contents of an MOOC course consists of video lectures, suggested reading materials, discussion forums and also assignments and quizzes [22].

The video section is the most valuable and unique component of any an online course as it enables an expert (the instructor) to deliver his /her expertise (built up over years of researching and teaching a subject) in an extraordinarily efficient way. Students generally don't need to purchase books for these courses, due to the fact all reading material is either be provided inside the MOOC content or is linked to open access texts[23].

MOOCs offer interactive user forums that assist build a community for the students and the instructors. Discussion forums in MOOCs aim to create the interaction between course participants. Learners are able to share and discuss information and opinions with others from all over the world .

In a typical MOOC, students view video lectures online and interact with one another using discussion forums. Some MOOC courses involve students to take an online quiz or test with multiple choice answers that can be graded automatically.

The assignments are an essential component of MOOCs .Some MOOC courses need students to finish assignments and upload the answers into the MOOC platform. These assignments may be evaluated and graded automatically or by instructor [24].

4. MOOC TECHNIQUES

MOOC techniques may differ from one platform to another, also in two different courses within the same platform. Most techniques of the MOOC are the same as those used in traditional classrooms, such as having a start and end time, quizzes, assignments, final

QALAAI ZANIST JOURNAL
A Scientific Quarterly Refereed Journal Issued by Lebanese French University – Erbil – Kurdistan – Iraq
Vol. (2), No. (2), April 2017
Speical Issue : The 1st International Conference on Information Technology (ICoIT'17)
ISSN 2518-6566 (Online) - ISSN 2518-6558 (Print)

exam and certificate. But, MOOC platform might handle these differently depend on the tools and technologies available to MOOC. Another technique that might be hard to apply in classical classrooms and can be used in MOOC, is to create a community among learners by integrating social media in the communication between participants [25]. In this section, we discuss some of the main MOOC techniques in three categories. Although each technique is listed under one category, some techniques might have an overlap with other categories [26].

4.1 Design Techniques

Design techniques are those that used the MOOC's connectivism theory as the main method. They also draw the basic of MOOC principles and values to be achieved. Here are some of these techniques :

- Personalized curriculum: Course content of MOOC is designed mainly for online use so that the lecture is divided into smaller parts, each of which represents a topic [27]. Hence, these topics could be taken independently based on the student's need, knowledge and available time. Moreover, each student can assessment their gained knowledge at the end of each topic, either in a small quiz or in questions. Due to this way, the student could focus on the actual topic rather potentially being lost in the middle of the class while the instructor moves on to other topics [28].
- Active retrieval practice: Incorporating the recovery of knowledge into MOOCs improves the learning process. As research suggested, retrieval of knowledge is not simply restating the facts, "the act of reconstructing knowledge itself enhances learning." Retrieval practice is not restricted to online learning. However, in an online setting, all students are required to go through the same process [29]. Take for example if the instructor asks a question during a lecture, one student might answer the question while possibly half of the students were not aware that there was a question posed in the first place. In MOOC, every student is forced to answer any question posted during the video and engage with the material [30].
- One-on-one tutoring: Peer tutoring has been proven to give the best learning result. Using this technology, MOOC can simulate, to an extent, a tutor who is customized and personalized for each student. Furthermore, if the course content itself is satisfactory for some students, they could act as tutors for other students [31].
- Global community: Having a massive number of students all over the world would make a community around the MOOC course, so the students have the opportunity to connect with each other by posting a question and providing an answer in an impressively short response time [32].

4.2 Development Techniques

These are techniques that implement the design and ensure that the tool used achieves the design goal. Example, the usage of customizable tools targets the personalized curriculum technique in design. Moreover, inserting short quizzes within the course material targets active retrieval practice. Below illustrate some additional development techniques [33]:

- Automated grading: The automatic grading is interactive, hence, it provides instant feedback to students and provides them the opportunity to take the quiz again. The

QALAAI ZANIST JOURNAL
A Scientific Quarterly Refereed Journal Issued by Lebanese French University – Erbil – Kurdistan – Iraq
Vol. (2), No. (2), April 2017
Speical Issue : The 1st International Conference on Information Technology (ICoIT'17)
ISSN 2518-6566 (Online) - ISSN 2518-6558 (Print)

technology has been improving to allow automatic grading in a lot of fields like math, science, financial models and in programming [34].

- Peer grading: On the subject of disciplines that require critical thinking, automatic grading does not work. Coursera has provided peer grading to solve this issue. Note that peer grading does not only solve this problem whereas a massive number of assignments in such disciplines as sociology and business. Importantly, peer grading improves the learning process whereby students get the opportunity to correspond with the knowledge and can explore the solutions from the different point of view [35].
- Data collection and analysis: The amount of data that be collected and the analysis applied could arise the learning process to a different dimension. This can be done by understanding the students' needs and providing more interactive and personalized responses to students, which ultimately improves the educational process [36].

4.3 Deployment Techniques

Deployment techniques are the delivery methods for MOOC platform or MOOC courses .

- Open-source platform: Systems like Moodle, Open MOOC7 and edX are open-source- based platforms that provide MOOC courses. These systems offer the option and flexibility of either being an independent MOOC platform setup or just hosting a MOOC course in an existing platform. Some of the programing languages used in these systems include PHP, Python, Ruby on Rails, and JavaScript [37].
- Proprietary system: Blackboard's Course Site, Desire2Learn's Open Course, and In structure's Canvas are examples of these systems. Some provide limited courses, hosting, and functionalities free of charge, but in order to get the full package, organizations are required to purchase the license [38].
- Software as a Service (SaaS): "mooc.org" is a newly-built platform by Google and edX to allow creating and hosting MOOC courses. At first, Google started its own Course Builder platform which provided users with the capability to create MOOC courses and deploy them on the Google app engine [39].

5. ARCHITECTURE/ TECHNICAL METHODS OF MOOCS

The main interface of the platform is designed by using the following techniques and as illustrated in **Figure (2):**

1. **HTML5 & CSS3:** HTML language is used over all to design the page layout, while the style of the web page is created using CSS language.
2. **JavaScript:** the animations and validation task is created by JavaScript language.
3. **PHP:** the back end codes that control the front end logic is applied by PHP language.
4. **MYSQL:** is used as a database for the created project and manipulation by the MYSQL language.
5. **Apache Server:** Platform will be operated, using Apache server.
6. **Windows 10**: is the used system for the Platform.

QALAAI ZANIST JOURNAL
A Scientific Quarterly Refereed Journal Issued by Lebanese French University – Erbil – Kurdistan – Iraq
Vol. (2), No. (2), April 2017
Speical Issue : The 1st International Conference on Information Technology (ICoIT'17)
ISSN 2518-6566 (Online) - ISSN 2518-6558 (Print)

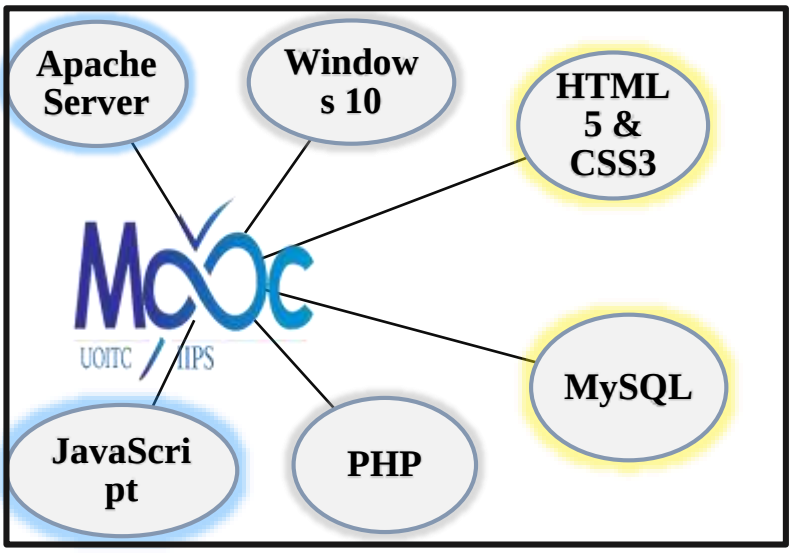

Figure (2): MOOCs Technical Platform

6. MOOC TOOLS/TECHNOLOGIES

There is many numbers of tools that could be used in MOOC, a lot of which we might not be able to mention in this paper, however, we will point out the most widely used tools in MOOC and highlight their importance to the MOOC platform. On the other hand, most of these tools can fall into one or more of these categories [40]:

6.1 Content Management Tools

An example of these tools: video, audio, presentation and text .These are the tools that deal with the main content of the course and they are the primary tools of MOOCs as they are the course objects or the delivery tool of the objects that contain the initial knowledge shared. The designer of the MOOC platform usually integrates more than one of these tools to improve interaction. The content is uploaded or posted by the course instructor using one of these tools, either via video, audio, presentation, or text document. In MOOCs, the contents are rather short in time or small in size in order to enhance the student's understanding and gain of knowledge. Moreover, the contents usually include an assessment tool to motivate the student's understanding by applying a retrieval practice of the main idea into the lecture. Althoughwe see the combination of the tools, content management, and assessment tools, the content does not include all the knowledge that the students require. Based on the original MOOC, or what is now called cMOOC, knowledge is created and generated during the course as participants contribute to the course material through their discussion about the topic. Although there is an area for discussion, contribution and knowledge sharing in MOOC – as we will see in the discussion tools – is not linked to the contents like the assessment tools, which makes discussions sometimes seem to be irrelevant information rather than concrete knowledge [41].

6.2 Social Media Tools

An example of these tools: Facebook, Twitter, Google+, Linked in and My Space . These are the tools that create the learning community and encourage collaboration among participants to support the educational process in MOOC. Moreover, they open the learning

QALAAI ZANIST JOURNAL
A Scientific Quarterly Refereed Journal Issued by Lebanese French University – Erbil – Kurdistan – Iraq
Vol. (2), No. (2), April 2017
Speical Issue : The 1st International Conference on Information Technology (ICoIT'17)
ISSN 2518-6566 (Online) - ISSN 2518-6558 (Print)

materials to the outside world and attract interest from others, as users begin to share their MOOC activities and experiences within their own social networks [42].

6.3 Discussion and Collaborative Tools

An example of these tools: Discussion forums, Wikis, Blogs, Micro- blogs, and Virtual study groups/meeting .

Discussion forums are the major and most common tool of communication used in any LMS. Especially in traditional LMSs - it is the only tool that allows collaboration among participants. For that reason, it has become a standard feature of LMSs. This feature as well carried its way to MOOC platforms. The major purpose of discussion forums is to create a learning community by encouraging students to share their knowledge and contribute with their own discussion, either in a form of a question or comments similar to discussions in a classroom. However, the tool was not intended at first to be used for educational purpose. Students were not enticed to participate, as neither the system nor the designers promoted such features [43].

The LMS can also include other discussion tools such as real-time discussions, Wikis, Blogs, and Micro-blogs, all of which can facilitate engagement among participants and encourage collaboration in a way that suits each individual. The new MOOC platforms do use some of these tools to create the learning community, however, most of the time they are used in isolation of each other and of the main course content [44].

6.4 File Management Tools

An example of these tools: Google Drive, Microsoft Office, and Drop Box .Shared and collaborative files are the tools mentioned to in this category. Shared files simplify collaboration between participants. Some of these tools permit single access to files, while others which are better for collaboration permit multiple synchronous access. For example, users can access the same file and work on the same document and are capable of seeing their changes directly. The best example of these tools is Google Drive, which provides the basic and most widely used collaboration files: documents, presentations, spreadsheets, and drawings. It has the option to link other existing file types from a preset list. Due to the fact that these tools are commonly used for collaborative deliverables, MOOC does not need to use most of their functionalities. However, MOOC focuses on collaborative and shared knowledge, which make Wikis and Blogs the perfect tools for that purpose [45].

6.5 Notification Tools

An example of these tools: Emails, RSS feed, and Posts. Notification tools are very important in the MOOC platform as well as in any LMS. They could be used for group or broadcast communication. On the other hand, not everyone has the desire or the time to always check emails. Mainly with the many numbers of learners in the system, quantity of emails could be massive. Hence, we need a smart tool that allows customization and personalization of notifications. Having such a tool encourages collaboration and fast response among participants by enabling notification with the most suitable tool that fits the learner's objectives. In addition, these tools can be included with the student's daily used accounts so it does not become an additional burden. One way to integrate personalized notification is to partner with social media sites and enable one login feature. Using one login via the different social media sites or email accounts, the MOOC course is connected to that

QALAAI ZANIST JOURNAL
A Scientific Quarterly Refereed Journal Issued by Lebanese French University – Erbil – Kurdistan – Iraq
Vol. (2), No. (2), April 2017
Speical Issue : The 1st International Conference on Information Technology (ICoIT'17)
ISSN 2518-6566 (Online) - ISSN 2518-6558 (Print)

site and can drive notifications to the learners via the most convenient method to the learner [46].

6.6 Assessment Tools

These are the tools that help instructors to create course assessments to record students' grades and progress. Most assessments need to be the automated-grading type. But when it comes to open-ended questions, the assessment should use a different scheme or style (i.e. peer assessment) [47].

6.7 Analytical Tools

These tools are used primarily in the background by administrators to offer important statistics about courses, usage, and users' activity. These statistics are used by designers and decision-makers to improve the platform. For example, Coursera studies these statistics carefully and makes modifications consequently to improve the user experience [48].

7. SITE DIAGRAM TOOL

Site diagram describes the whole structure of the site and how pages are connected with each other.

The structure of the website page must be chosen before considering the visuals. The architecture information is used to describe the planning of a website structure .There are two types of navigation structures that will eventually translated to the navigation menus; wide and deep.

Wide navigation system is used for small web sites; the main pages are all visible together. Deep navigation, coordinate the pages into categories.

The deep navigation system is selected for the MOOC portal website, because it is the optimal solution for a large websites, drop-down menus and secondary navigation menu, as shown below in **Figure (3)**.Tool that used to draw this diagram is lucidchart which considered better solution for visual communication. Online flowcharts, diagrams, and ER models [49].

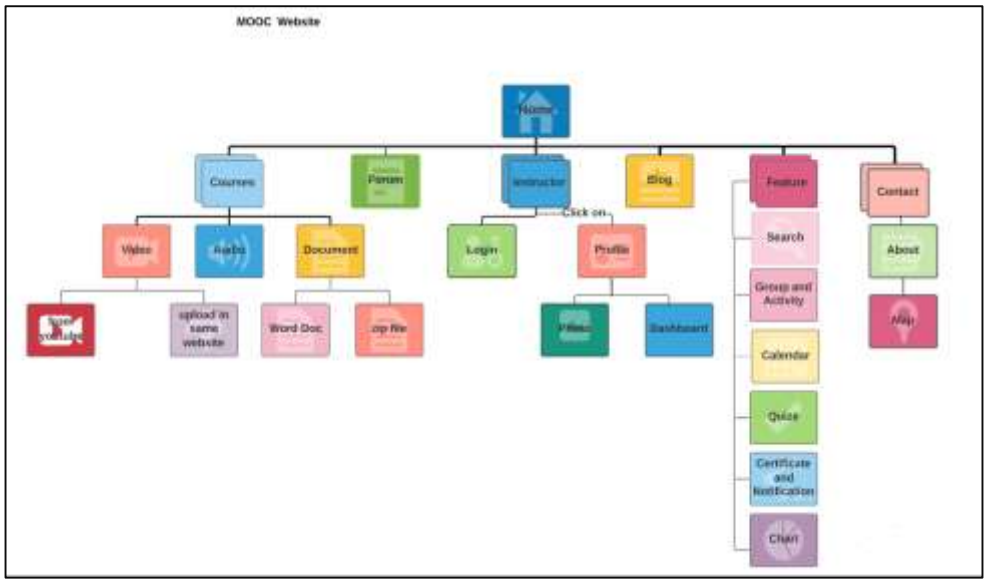

Figure (3): Shows MOOC Site Diagram

QALAAI ZANIST JOURNAL
A Scientific Quarterly Refereed Journal Issued by Lebanese French University – Erbil – Kurdistan – Iraq
Vol. (2), No. (2), April 2017
Speical Issue : The 1st International Conference on Information Technology (ICoIT'17)
ISSN 2518-6566 (Online) - ISSN 2518-6558 (Print)

8. WIREFRAME DIAGRAMS

A wireframe diagram shows the structure of web page using only outlines for each widget and content type, as shown in **Figure (4)**.The purpose of wireframe diagram is to give basic idea about home page interface without any graphic design. Best toot that used to draw wireframe diagram is Pencil [50].

Figure (4): Shows the MOOC Wireframe Diagram

9. CONCLUSION

In this paper a new developed design of MOOC system is offered. The newly developed design is based on all recent techniques and tools that are needed to run online courses building them from the ground up and right to provide students with certificates of completion by using the most efficient languages that are known in nowadays; the PHP7 scripting language ,MySQL language, HTML language, CSS language and finally JavaScript programming language. The new platform is constructed with advanced features to make online education more effective than the traditional class room methods. It offers a safe and an easy way for learners and instructors to exchange ideas, share content or information, connect and collaborate-anytime, anywhere and other. The new web design is thought to fulfill the most efficient features including instructor and student dashboards, online quiz and certificate, progress tracking and support for multimedia classes, in addition to a mobile friendly themes that are thought to save time and money. The new web page is designed and implemented to fit the general curriculum provided by the Iraqi ministry of higher education and is thought to spread usage of E-learning in Iraq and also establish the first E-Iraqi University.

QALAAI ZANIST JOURNAL
A Scientific Quarterly Refereed Journal Issued by Lebanese French University – Erbil – Kurdistan – Iraq
Vol. (2), No. (2), April 2017
Speical Issue : The 1st International Conference on Information Technology (ICoIT'17)
ISSN 2518-6566 (Online) - ISSN 2518-6558 (Print)

10. REFERENCES

1. Mosakhani, M., & Jamporazmey, M. (2010). Introduce critical success factors (CSFs) of elearning for evaluating e-learning implementation success. Educational and Information Technology (ICEIT), IEEE
2. Agboola, A.K. (2006). Assessing the awareness and perceptions of academic staff in using e-learning tools for instructional delivery in a post-secondary institution: A case study. The Public Sector Innovation Journal, 11(3), 1-6.
3. Ajadi, T.O., Salawu, I.O., & Adeoye, F.A. (2008). E-learning and distance education in Nigeria. Turkish Online Journal of Educational Technology, 7(4), 1-7.
4. D Koller, A Ng, C Do, and Z Chen, "Retention and intention in Massive Open Online Courses," EDUCAUSE Review, vol. 48, no. 3, 2013.
5. Anderson, D. Huttenlocher, J. Kleinberg, and J. Leskovec. (2015) “Engaging with Massive Online Courses,” in WWW. ACM, 2014, pp. 687–698. [5] C. G. Brinton and M. Chiang, “MOOC Performance Prediction via Clickstream Data and Social Learning Networks,” in INFOCOM. IEEE.
6. Caswell, T. et al. (2008). “Open educational resources: enabling universal education.” International Review of Research in Open & Distance Learning, 9 .(1)
7. B. Fogg. .(2009) A behavior model for persuasive design. In Proceedings of the 4th international Conference on Persuasive Technology, page 40. ACM.
8. Gilbert, S. Morton, and J. Rowley, "e-Learning: The student experience," British Journal of Educational Technology, vol. 38, no. 4, pp. 560-573.
9. C. G. Brinton, M. Chiang, S. Jain, H. Lam, Z. Liu, and F. M. F. Wong. (2014) “Learning About Social Learning in MOOCs: From Statistical Analysis to Generative Model,” Transactions on Learning Technologies, vol. 7, pp. 346–359.
10. McCallum, C. M., Thomas, S. and Libarkin, J., The AlphaMOOC: Building a Massive Open Online Course one graduate student at a time, 2013, Issue 33, ISSN: 1887-1542.
11. Creelman, A., Ehlers, U., & Ossinnilsson, E. (2014). Perspectives on MOOC quality An account of the EFQUEL MOOC Quality Project. INNOQUAL - International Journal for Innovation and Quality in Learning , 2 (3), 78-87.
12. Creed-Dikeogu, G., & Clark, C. (2013). Are you MOOC-ing yet? A review for academic libraries. Kansas Library Association College and University Libraries Section Proceedings, 3 (1), 9-13.
13. D. Russell, et al.(2013), "Will Massive Online Open Courses change the education?," in CHI '13 Extended Abstracts on Human Factors in Computing Systems, Paris,France, , pp. 2395-2398 .
14. J. Basque and B. Pudelko. (2010), “Exploring the potential of blended learning to promote retention and achievement in higher education professional study programs,” 9th International Conference on Information Technology based Higher Education and Training ITHET, Cappadocia, pp. 383-390.

15. R. Gluga, T. Lever, and J. Kay.(2013), "Foundations for Modelling University Curricula in Terms of Multiple Learning Goal Set," IEEE Trans. Learning Technologies, vol. 6, no. 1, pp. 25–37.
16. Cooper, S. & Sahami, M.(2013), Reflections on Stanford's MOOCs: New possibilities in online education create new challenges. Communications of the ACM56(2), 28-30, doi: 10.1145/2408776.2408787.
17. deWaard, I., Abajian, S., Gallagher, M. S., Hogue, R., Keskin, N., Koutropoulos, A., & Rodriguez, O. C. (2011). Using mLearning and MOOCs to understand chaos, emergence, and complexity in education. The International Review of Research in Open and Distance Learning, 12(7), 94-115.
18. Gamage, D., Perera, I., & Fernando, S. (2014). Effectiveness of eLearning through MOOC: lessons learnt in selecting a MOOC. The 22nd International Conference on Computers in Education (ICCE 2014). Nara.Japan.
19. K. Veeramachaneni, F. Dernoncourt, C. Taylor, Z. Pardos, and U.-M. O'Reilly, "Moocdb: Developing data standards for mooc data science," in AIED 2013 Workshops Proceedings Volume. Citeseer, 2013, p. 17
20. Martin, F. G. (2012). Will massive open online courses change how we teach? Communications of the ACM, 55(8), 26-28. doi: 10.1145/2240236.2240246
21. Fini, A. (2009). The technological dimension of a massive open online course: The case of the CCK08 course tools. The International Review Of Research In Open And Distance Learning, 10 .(5)
22. J. Mackness and R. Williams.(2010), "The ideals and reality of participating in MOOC," in Networked Learing Conference, London, pp. 266-275.
23. Kizilcec, R. F., Piech, C., & Schneider, E. (2013). Deconstructing disengagement: Analyzing learner subpopulations in Massive Open Online Courses. Third International Conference on Learning Analytics and Knowledge. Leuven, Belgium
24. Hew, K. F., & Cheung, W. S. (2014). Students' and instructors' use of massive open online courses (MOOCs): Motivations and challenges. Educational Research Review, 12, 45-58. doi: 10.1016/j.edurev.2014.05.001
25. Chew, Renee S.Y. (2011). Perceptions of online learning in an Australian university: Malaysian students' perspectives. Doctoral dissertation. Queensland University of Technology .
26. I. Titov and R. McDonald.(2008), Modeling online reviews with multi-grain topic models. In Proceedings of the 17th international conference on World Wide Web, pages 111–120. ACM,
27. Russell, D.M., Klemmer, S., Fox, A., Latulipe, C., Duneier, M., and Losh, E.(2013), Will Massive Online Open Courses (MOOCs) Change Education? , in: CHI '13 Extended Abstracts on Human Factors in Computing Systems. Paris, France: ACM, pp. 2395-2398.
28. Tomkin, J.H., Charlevoix, D.(2014): Do Professors Matter?: Using an A/B Test to Evaluate the Impact of Instructor Involvement on MOOC Student Outcomes. In: Proceedings of the First ACM Conference on Learning at Scale Conference. pp. 71–78. L@S'14, ACM .

29. Colvin, K. F., Champaign, J., Zhou, A., Fredericks, C., & Pritchard, D. E. (2014). Learning in an Introductory Physics MOOC: All Cohorts Learn Equally, Including an On-Campus Class. The International Review of Research in Open and Distributed Learning (IRRODL) , 15 (4).
30. Kop, R. (2011), The challenges to Connectivist learning on open online networks: Learning experience during a massive open online course. International Review of Research in Open and Distance learning, 12(3), 19-37.
31. M Bali.(2014), "MOOC Pedagogy: Gleaning Good Practice from Existing MOOCs," Journal of Online Teaching and Learning (JOLT), vol. 10, no. 1, pp. 44-57.
32. K. Masters .(2011), "A brief guide to understanding MOOCs," The Internet Journal of Medical Education, pp. 2-4,.
33. Manir, K. A. (2011). Implication of ICT's in libraries of higher education institutes: A panacea catapulting library development in Africa. DESIDOC Journal of Library & Information Technology, 31(1), 65-71.
34. T. R. Liyanagunawardena, A. A. Adams, and S. A. Williams, "MOOCs: A systematic study of the published literature 2008-2012," The International Review of Research in Open and Distance Learning, vol. 14, no. 3, pp. 202-227, 2013 .
35. Pantò E., Comas-Quinn A. (2013), The Challenge of Open Education, Journal of e-Learning and Knowledge Society, v.9, n.1, 11-22
36. Milligan, C., Littlejohn, A., and Margaryan, A.(2013), Patterns of engagement in connectivist MOOCs, Journal of Online Learning and Teaching ,9(2), pp 149-159.
37. R. F. Kizilcec, C. Piech, and E. Schneider, Deconstructing disengagement: analyzing learner subpopulations in massive open online courses, In Third Conference on Learning Analytics and Knowledge, 2013, pages 170–179.
38. Mak, S., Williams, R., and Mackness, J, Blogs and Forums as Communication and Learning Tools in a MOOC, Networked Learning Conference, 2010, pp. 275-2.
39. S. Jiang, A. Williams, K. Schenke, M. Warschauer, amd D. O"Dowd, "Predicting MOOC performance with week 1 behavior," in Proc. the 7th International Conference Educational Data Mining, London, pp. 273-275, July 2014
40. Mackness, J., Mak, S., and Williams, R. The ideals and reality of participating in a MOOC. In International Conference on Networked Learning 2010. 266–275. 23.
41. Skiba, D. J. (2012). Disruption in higher education: Massively open online courses (MOOCs). Nursing education perspectives , 33 (6), 416-417.
42. Vihavainen, a., Luukkainen, & Kurhila, J. (2012 October). Multifacted support for MOOC in Programming. SIGITE'12 of ACM. 171-176. doi: 978-1-4503-1464-0.
43. Clow, D. MOOCs and the funnel of participation. In LAK '13: 3rd International Conference on Learning Analytics & Knowledge (2013). 9.
44. Cormier, D., and Siemens, G., The Open Course: Through the Open Door-Open Courses as Research, Learning, and Engagement, 2010, pp. 30-32.
45. S. Goldrick-Rab. Challenges and opportunities for improving community college student success. Review of Educational Research, 80(3):437–469, 2010.

46. Y. Wang and R. Baker. Mooc learner motivation and course completion rate. MOOC Research Initiative Conference, 2013.
47. AF Yousef, M, A Chatti, U Schroeder, and M Wosnitza, "What Drives a Successful MOOC? An Empirical Examination of Criteria to Assure Design Quality of MOOCs," in Advanced Learning Technologies (ICALT) IEEE14th International Conference, 2014, pp. 44-48.
48. B. Kim and T. Reeves. Reframing research on learning with technology: in search of the meaning of cognitive tools. Instructional Science, 35(3):207–256, 2007.
49. Robbins, J.N., Learning Web Design. Fourth Edition ed. 2012, Inc., 1005 Gravenstein Highway North, Sebastopol, CA 95472: O'Reilly Media. 603.
50. Paul Deitel, H.D., Abbey Deitel, Internet and World Wide Web: How to Program. 5th ed. How To Program Series. Vol. 1. 2012: Prentice Hall. 923.