International Journal of Engineering & Technology, 7 (4.11) (2018) 70-74

International Journal of Engineering & Technology

Website: www.sciencepubco.com/index.php/IJET

Research paper

MOOC Platforms: a Review and Comparison

Ummy Gusti Salamah[1], Rabab Alayham Abbas Helmi[2]*

[1]*Faculty of School of Graduates Studies, Management and Science University, Malaysia*
[2]*Faculty of Information Science and Engineering, Management and Science University, Malaysia*
**Corresponding author E-mail: rabab_alayham@msu.edu.my*

Abstract

For development courses in the Massive Open Online Courses (MOOC) requires the support of good technological infrastructure. Some MOOC platforms are part of the institution but some platforms are built by individual teachers or instructors. The objective of this study to reviews about characteristics in MOOC platforms and evaluation of comparison based on previous studies with specific in MOOC platforms. The databases in MOOC studies found in four databases namely Google Scholar, IEEExplore, Elsevier Science Direct, and Emerald. After the databases filtered, 20 papers in MOOC studies that selected and 4 databases related in development Open Learning and Udemy platforms. This study aims to bring the knowledge for the developer or research groups about MOOC platforms and as a consideration to choose which one suitable platforms to create, manage, and deliver courses.

Keywords: *MOOC; MOOC Platforms; Open Learning; Udemy*

1. Introduction

A current advancement in advanced education and distance education is the Massive Open Online Course (MOOC) that provides free access and intelligent innovation to students all around the world through web and different advances of technology [1]. Several MOOC has more than 2000 participants and has a few of the traditions of a common course, it also coordinates the availability of long-range informal communication like a social network, the help of a recognized master in their field, and an accessible of openly available online assets [2]. It certainly increases an institution's reach because they tend to attract a large number of students to sign up due to the courses being so easily accessible to anyone around the world with an Internet connection [3].

There are three fundamental reasons why teachers want to teach in MOOC: teachers have motivated by a feeling of interest, want to increase some individual rewards or a feeling of unselfishness. For students, there are four reasons why students want to join in a MOOC. First, to begin with on the grounds that they need to find out about related subject with their studies, their insight can be increment, to rehash their course that they had learned previously, or to take in a few points that assistance them in their examinations, because it is similar things like borrowing several books to learn from the library [4]. A vital finding of MOOC is openness and reputation receptiveness, these are the two most grounded indicators to disclose MOOC expectation to use. Confirmation of user expectations had the greatest influence on user satisfaction. Openness and reputation receptiveness are ways that MOOC providers can both separate themselves from contenders and upgrade a person's expectation for proceeded with MOOC enlistment [5].

Massive Open Online Courses (MOOC) are a disruptive trend in education. A few activities have developed amid the most recent months to offer support to MOOCs, and numerous teachers have begun offering courses in MOOCs in various areas and disciplines [6]. It is currently the greatest exponent of open education [7]. Besides, concerning the connection between learning premium and students' goal to utilize MOOC, the outcomes recommend that expanding the students' advantage will build their expectation to learn by means of MOOC [8].

In synopsis, the gathering of members without past experience in MOOC esteemed the essential versatile plan of courses more profoundly. They particularly favored two versatile highlights: that associate evaluation that to be completed by isolating students to their interest groups, and that the course should offer extraordinary exercises as indicated by decisions and learning results [9]. The effectiveness of MOOC according to the students' perspective was analyzed from the advantages of online learning is a contribution of the video [10]. Because learning by video, the student can enhance their learning experience. Besides video, students or learners also interested in games learning. A game-based mobile application offers the new feature in the world of learning, especially learning on MOOC. Smaller groups of students in SPOC (Small Private Online Courses) were examined this feature in learning by a game mobile application. The results show that the interaction of groups in learning MOOC with games can increase and more interactive [11].

The more difficult course makes more experienced students, the herding is more rational. With the groups of development and the students' experience, more rational of online learning tends to become, and then the foundation for the development's long-term of the model in MOOC [12]. So, the result of all MOOC platforms has many differences such as in terms of their duration, learning activities, assessment, social interaction and instructors' participation [13].

Related to previous studies, MOOC is the main important factor in learning and teaching experience. There are already MOOC of online learning platform offered in developing countries. There are two selected free MOOC platforms to create courses, these are Open Learning (Openlearning.com) and Udemy (Udemy.com). This study aims to identify e-learning in MOOC platforms especially in Open Learning and Udemy platforms to development or create a course for students and identify the reviews to explore the previous studies which have been focusing on identifying the fac-

Copyright © 2018 Authors. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

tors about characteristics MOOC platforms, MOOCs' quality factors, and comparison Open Learning and Udemy platforms in different courses.

2. Methodology

In this work is divided to four steps methodology (see Fig. 1) which includes: (1) Selection of databases in MOOC, (2) Reviews of characteristics in MOOC platforms, (3) Identification of Selected MOOC platforms, (4) Comparison about development MOOC platforms in different courses. These four steps of the methodology will be explained in the following below.

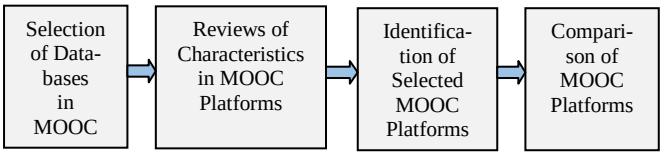

Fig. 1: Methodology

2.1. Selection of Databases in MOOC

There are four databases used in research such as Google Scholar, IEEExplore, Elsevier Science Direct, and Emerald as shown in Table 1. Using these databases because related to the research especially related to MOOC. The English language is the language criteria for the databases selection and the access of the selected databases from March until April 2018. Table 1 shown that the selected databases used ID, the ID is D1- D4 for describing electronic databases in categorization.

Table 1: Databases Used in Research

ID	Databases	URL
D1	Google Scholar	https://scholar.google.com/
D2	IEEExplore	https://ieeexplore.ieee.org/Xplore
D3	Elsevier Science Direct	https://www.sciencedirect.com/
D4	Emerald	https://www.emeraldinsight.com/

2.2. Reviews of Characteristics in MOOC Platforms

Related to previous studies in MOOC, there are 11 studies reviews about the characteristics of e-learning, especially in MOOC. This review is about how MOOC platforms can be accepted by students as an online learning tool. There are six characteristics of MOOC platforms such as *satisfaction, interaction, motivation, challenges, communication,* and *effectiveness.* This review aims to give knowledge to application developers or researchers to find out how should the platform be built.

2.3. Identification of Selected MOOC Platforms

After reviews about characteristics in MOOC platforms, the next steps are identification about MOOC platforms. According to the previous study, there are several MOOC platforms for development or create courses. But from many platforms, two selected platforms are Open Learning and Udemy because Open Learning is the platform with many features and requirements such as gamification tool, forum, and also content management tool (possible to make texts, videos, audios, and images) and then Udemy platform is the most visited and popular MOOC providers (based on Alexa Internet Global Ranking) [14, 15].

2.4. Comparison of MOOC Platforms

The last steps are evaluation in comparison of MOOC platforms. There are 4 papers related to MOOC platforms. Two papers related to Open Learning platform and two platforms related to the Udemy platform. The comparison is an evaluation of two platforms in different courses and it aims to provide an overview of Open Learning and Udemy platforms how to develop these platforms and how these platforms work.

3. Results and Discussion

3.1. Database Selection

In these databases have specific criteria. There are four categorize criteria such as (1) Years of the related paper from 2011 – 2018, (2) Types of the databases are journaling and conference papers with the English language, (3) Include the title and abstract, (4) Include related research in MOOC.

Using these criteria, 156 papers that found from the particular criteria and these papers also identify as related and relevant criteria for this reviews. Table 1 shows that four selected databases used in the research included the URL. These databases analyzed suitable and related to four criteria of our works.

The keywords for databases search are ("MOOC" OR "Massive Open Online Courses") AND ("Open Learning" OR "Udemy) as search terms and keywords of the literature review. These keywords were used also for the screen the titles, abstracts, and then full-text reading.

Figure 2 shows that there are 156 databases found by the keywords, they are 58 databases from Google Scholar, 49 databases from IEEExplore, 36 databases from Elsevier Science Direct, and 13 databases from Emerald. From 156 databases, we found that 66 records excluded based on the title and matches 90 papers after duplicates removed. After that, 27 based on abstract and conclusion has been removed and matches 63 papers. Excluded the records based on related studies has been removed 38 papers. Finally, studies included in full-text screening found 25 papers and 5 of the papers excluded in full-text screening, so the selected databases found 20 in this studies. The classification of selected databases related to two conditions, first related to MOOC platforms (Open Learning and Udemy) and second related to review in MOOC studies such as development, evaluation, comparative study, implementation, analysis, experimental, and the proposed method.

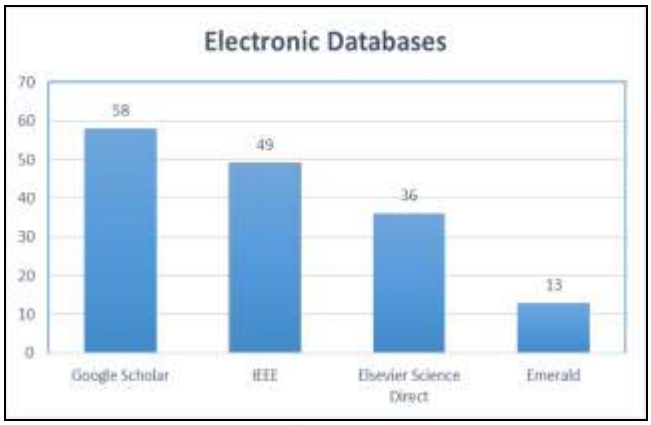

Fig. 2: Number of Databases by Keywords

Based on the country of 20 selected papers in MOOCs studies, there are ten countries as authors' location and the most MOOC research was Spain (n = 4), Malaysia, Brazil, and USA (n = 3), China (n = 2), and (n = 1) for India, Canada, Saudi Arabia, Australia, and Taiwan (see Fig. 3).

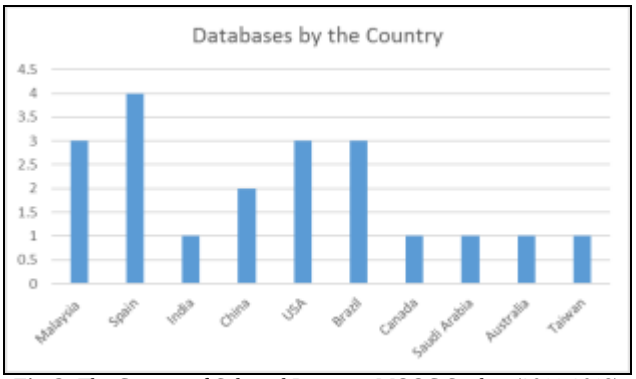

Fig. 3: The Country of Selected Papers in MOOC Studies (2011-2018)

Based on the authors' countries, our findings there are many researchers collaborate with other countries and some researchers also collaborate with the same country. As the detailed in years of 20 selected papers in MOOCs studies significantly from 2011-2018 and from the research types or method, they used types of evaluation, comparative study, analysis, development, and implementation. For the methods, some authors used mixed-method like qualitative and quantitative data such as survey, questionnaire, and study case are required.

3.2. Characteristics of MOOC Platforms

The Massive Open Online Courses (MOOCs) have the characteristic of bringing a new innovation [3]. The criteria of required MOOCs platform, it is about their characteristics such as *satisfaction*, *interaction*, *motivation*, *challenges*, *communication*, and *effectiveness* from a student's perspective. The description of characteristics in MOOC platforms will be evaluated in Table 2 below that shows 6 characteristics of MOOC platforms.

Table 2: Description of Characteristics in MOOC Platforms

References	Characteristics	Description
[16, 17]	Satisfaction	Satisfaction is usability and ability of use had an influence positively on students' satisfaction with the MOOC course. Satisfaction with the MOOC significantly had a useful influence and positive on students' expectation in learning using MOOC. Satisfaction aims to cultivate students' intention in using MOOC [16]. Student's satisfaction was "Convenience" as the most cited reason for satisfaction. "Lack of interaction" was the most cited reason for dissatisfaction [17]
[18, 19]	Interaction	Interaction is the main goal of students and teacher communication with effective, it is a challenge in MOOCs for students involved in backgrounds of learning, needs, and means [18]. Students' interaction with the teacher as an important factor in online learning [19].
[4]	Motivation	Students' motivation was in enrollment or signing up to MOOCs because since they needed to find out about a specific subject or to build their insight, to reviews what they had studied previously because many students learning and participating in MOOCs because of their motivation and goals.
[20, 21]	Challenges	The most challenges for the student to learning in MOOCs generated in terms of courses delivery and quick development timeline [20]. Language has been featured as a hindrance and the principal challenge for many understudies [21].
[22]	Communication	The potential of MOOCs is enabled to communication between users. Students allowed to communicate between student and student as well as student to teacher to get answers to questions.
[19, 23, 24]	Effectiveness	The factors of learning effectiveness according to the e-learning context that was utilized [19]. Effectiveness according to MOOCs in conventional classrooms makes positive effects on learning results, no noteworthy evidence of negative impacts for any groups of understudies, and satisfaction of students are lower levels in understudy fulfillment in blended or hybrid MOOCs in classrooms [23]. Two factors in MOOCs' effectiveness are students classified in two learning groups, learning with videos or with exercises [24].

3.3. MOOC Platforms Selection

There are many MOOC platforms such as Open Learning, Udemy, teachable, coursera, etc. The selected MOOC Platforms to create a free course categorized into 6 platforms, they are Open Learning, CourseSites, P2PU (Peer 2 Peer University), Versal, Udemy, and Eliademy [14]. This platform is the suitable one to manage and create a course, free platform, and easy to use by students. From the six MOOC platforms, it was found two selected platforms they are Open Learning and Udemy because many researchers used these platforms and these platforms identify as the best and suitable of the MOOC course needs [14].

Finally, another platform in four MOOC platforms was removed from the selected platforms because other platforms needed filling a form for feasibility tests. Open Learning (https://www.openlearning.com) and Udemy (https://www.udemy.com) are selected platforms to create, manage, and deliver a course. There are differences between both platforms, for Open Learning platform, it gives tools to teachers to make dynamic and interactive learning modules and Open Learning also gives assistance to make an interest community environment. While Udemy is designed to teach online full time or fully have the time and dedication, Udemy is more developed and has better usability and more to choose from, and Udemy is the better option because this platform allows sending email announcements to the students.

Open Learning platform (https://www.openlearning.com) and Udemy platform (https://www.udemy.com) as selected MOOC platform for delivering and managing the course. The further explanation of these two platforms for its complete descriptions shown in Table 3.

Table 3: Selected MOOC Platforms

MOOC Platforms	Descriptions
Open Learning (https://www.openlearning.com)	Open Learning is a platform for learning online that delivered a course to focus on groups or community, connectedness between students and teachers, and understudy commitment. Open Learning provides many features like a social media, these features are forums to students, they can comment and received a comment and makes interaction while learning.

	Open Learning has other intriguing features, for example, karma points that are gained through positive comments from peers, and badges that can be issued either consequently or when a specific learning objective is accomplished. Open Learning provides built-in galleries, wikis, and blog pages to highlight work and empower cooperation effort and companion criticism, while continually keeping up space for individuality [25].
Udemy (https://www.udemy.com)	Udemy is a worldwide commercial center for learning and educating on the web where understudies are acing new aptitudes and accomplishing their objectives by gaining from a broad library of more than 65,000 courses instructed by master educators. It was propelled in 2010 by originators Eren Bali, Oktay Caglara and Gagan Biyani and has raised $16 million (USD) in subsidizing from financial speculators [15]. All of the MOOC courses are created independently on Udemy's free-to-use platform by instructors. Udemy also provides a course building MOOC for potential instructors. It does not have an integrated learning analytics tool, but it does allow instructors to download student data for use in other analytic tools [26].

3.4. Comparison of MOOC Platforms in Different Courses

Table 3 shows that the result of a search term in MOOC platforms, they are Open Learning and Udemy. The selection of this platforms (Open Learning and Udemy) because based on previous studies, Open Learning and Udemy have their own advantages. These MOOC platforms provide to create a free course for students, so students enrolled the course with free access and they can get more information from the course directly when they enrolled the course and the courses also can access by the students anywhere and every time. Udemy and Open Learning platforms provide the ease to build free and paid courses [14]. According to characteristics in MOOC platforms as shown in Table 2, these platforms have these character in the development of the courses. Finally, both of these platforms is the suitable chosen for developing the course.

Table 4 shows that the selected MOOC platforms in different course according to previous works. Regarding the selection of MOOCs platform, there are four relevant and related studies in development MOOC platforms. Two studies evaluated about Open Learning (https://www.openlearning.com), the two courses analyzed are Entrepreneurship course and Arabic Course. And others studies evaluated about Udemy (https://www.udemy.com) platform, the two courses are Business of Medicine and Open Software Engineering.

First, in Open Learning for Entrepreneurship course are provides lectures, tutorials, quizzes and several projects for the students to work in groups on a business assignment. A unique feature in Entrepreneurship course is the daily exercise in brain rewiring, which presents the forum of discussion for students with a business mindset. This platform used openlearning.com as a MOOC platform. The MOOC especially in Open Learning is a suitable platform to teach Entrepreneurship and another similar course and also other courses like science and engineering [27]. In this course helps to highlight a few areas of conceivable noteworthy significance to students learning. For the future work, it is recommended to another researcher also evaluate about student's satisfaction in this Entrepreneurship course, with their different perceptions regards to the utilization of innovation, it might bring a more reliable evaluation of the ease in use of the platforms.

Second, in Open Learning for Arabic course, the development of a product in this study can access an application and website via smartphones or tablets [28]. The study found many of the students were interested about learning the Arabic language through the Massive Open Online Learning Courses especially in openlearning.com which increases the students' knowledge and also motivates them to learn Arabic and gives them opportunities to learning by themselves. It is recommended for learning in this Arabic course for the beginner because this course has a good, simple, and easy to learn with the animated display in its product. And also in this course, there is an online dictionary, animated video in Arabic, and learning module with videos, texts, images that are designed interactively to facilitate the user.

In Udemy platform, we found two selected papers that discuss Udemy in the different courses. First, for the Business of Medicine, the result is the most advantage in hosting on Udemy (udemy.com) the students can access the course with time and place according to with the desire of the students, the students allowed to take the course on campus or not in five weeks. The evaluations of this course can accept by the students and students can take course registration with free and also open to everyone [29]. Further investigation is required to decide whether this delivery method is an adequate and viable method for instructing in learning the medicinal school environment, especially in the Business of Medicine course.

And the evaluation of another course is in Open Software Engineering Course that hosted in Udemy (udemy.com). The results demonstrated that understudies who approached online course accomplish preferred execution than students only taking the conventional course [30]. In this paper comparing the students' performance in the online course and students' performance in the conventional course. As further work, the suggestion to this study compares the performance of students in a conventional course with students in an online course in terms of student performance, effort, and cost in online or conventional courses.

Table 4: Comparison of Selected Platforms

MOOC Platforms	Course	Link
Open Learning	Entrepreneurship	https://www.openlearning.com/courses/Entrepreneurship
	Arabic	https://www.openlearning.com/courses/uba-2012/HomePage
Udemy	Business of Medicine	https://www.udemy.com/business-of-medicine
	Open Software Engineering	https://www.udemy.com/engenharia-de-software-ufmg/

4. Conclusion and Future Work

This study focuses on reviews and evaluation of comparison in MOOCs platform for developmental courses. The selected MOOC platforms are Open Learning and Udemy and in previous research has developed courses in Open Learning and Udemy, as result, these platforms have their respective advantages, such as can install applications (apps) with free and making the interaction with students very easier [14]. Based on the results, the students who approached MOOC platforms accomplish preferable performance than conventional learning [30]. The principle challenge today with MOOCs is to distinguish what is the best model and the best practice in utilizing this innovation [31]. Our findings from this reviews show how the platforms can affect the students in the learning experience. The best MOOC platforms must have characteristics for bringing new innovation to a learning environment [3], the characteristics are satisfaction, interaction, motivation, challenges, communication, and effectiveness. The study reported in this paper is a part of an ongoing research on MOOC. Finally, it is

imperative to make an in-depth investigation of the platforms to choose the one that best suits the MOOC developer's needs between Open Learning and Udemy platforms. it is trusted that this work can enable the individuals who to don't have sufficient technological infrastructure to create, manage and deliver a MOOC and wish to contribute learning and improve education progress in the world. The worldview of online learning is still new, however, it has already impacted the instructing and learning ways. A platform that accordance with the expectations of instructors' and students' desires is the initial step to make information an open decent. Open Learning and Udemy as the selected platforms that are appropriate to use in teaching and learning experiences. So in the future works will be further tested which platform is the best platforms and very suitable for the students according to the characteristics of MOOC platforms to access and development the courses. To compare and identify which MOOC platforms that best suits for course user's needs, it is important to explain about requirements that shows the basic conditions in the platforms. It was the main goal to identify such requirements in the scientific literature, and it will be presented in the next topic.

Acknowledgement

The authors want to express gratitude to Management and Science University MSU, Shah Alam Malaysia.

References

[1] M. Conache, R. Dima, and A. Mutu, "A comparative analysis of MOOC (Massive Open Online Course) platforms," *Informatica Economica*, 20(2), 5-14, 2016.

[2] A. A. Mcauley, B. Stewart, G. Siemens, and D. Cormier, "The MOOC model for digital practice. 2010, https://s3.amazonaws.com/academia.edu.documents/43171388/MOOC_Final.pdf?AWSAccessKeyId=AKIAIWOWYYGZ2Y53UL3A&Expires=1534065666&Signature=tTjOEx7Mx6obwIeEsG2CG0%2Fe1dY%3D&response-content-disposition=inline%3B%20filename%3DThe_MOOC_Model_for_Digital_Practice.pdf.

[3] J. D. Comeau, "Digital 'tsunami' in higher education: Democratisation movement towards open and free education," *Turkish Online Journal of Distance Education*, 14(3), 198–224, 2013.

[4] K. F. Hew and W. S. Cheung, "Students' and instructors' use of massive open online courses (MOOCs): Motivations and challenges," *Educ. Res. Rev.*, 12, 45–58, 2014.

[5] K. M. Alraimi, H. Zo, and A. P. Ciganek, "Understanding the MOOCs continuance: The role of openness and reputation," *Comput. Educ.*, 80, 28–38, 2015.

[6] C. Alario-hoyos, M. Pérez-sanagustín, D. Cormier, and C. Delgado-kloos, "Proposal for a conceptual framework for educators to describe and design MOOCs," *Journal of Universal Computer Science*, 20(1), 6–23, 2014.

[7] Á. F. Blanco, M. L. S. Lacleta, O. B. Gené, F. José, and G. Peñalvo, "Educación en abierto: Integración de un MOOC con una asignatura académica = Open education: Integration of a MOOC with an academic subject," *Teoría de la Educación. Educación y Cultura en la Sociedad de la Información*, 15(3), 233–255, 2014.

[8] Y. Hsun Tsai, C. Hung Lin, J. Chao Hong, and K. Hsin Tai, "The effects of metacognition on online learning interest and continuance to learn with MOOCs," *Comput. Educ.*, 121, 18–29, 2018.

[9] D. Lerís, M. L. Sein-Echaluce, M. Hernández, and C. Bueno, "Validation of indicators for implementing an adaptive platform for MOOCs," *Comput. Human Behav.*, 72, 783–795, 2017.

[10] S. S. Sahasrabudhe, & S. Majumdar, "MOOC for skill development in 3D animation," *Proceedings of the IEEE 16th International Conference on Advanced Learning Technologies*, 2016, pp. 6–7, 2016.

[11] L. Ramírez-donoso, J. S. Rojas-riethmuller, M. Pérez-sanagustín, and A. Neyem, "Enhancing collaborative learning in higher education online courses through a mobile game app," *Proceedings of the IEEE 21st International Conference on Computer Supported Cooperative Work in Design*, pp. 103–108, 2017.

[12] W. Wang, L. Guo, and R. Sun, "Computers in human behavior rational herd behavior in online learning: Insights from MOOC," *Comput. Human Behav.*, 2017, http://sci-hub.tw/10.1016/j.chb.2017.10.009.

[13] Billy Tak Ming Wong, "Article information: Pedagogic orientations of MOOC platforms: Influence on course delivery," *Asian Association of Open Universities Journal*, 10(2), 49-66, 2015.

[14] A. Zancanaro and C. S. Nunes, "Evaluation of free platforms for delivery of Massive Open Online Courses (MOOCs)," *Turkish Online Journal of Distance Education*, 18(1), 166–181, 2017.

[15] L. Wilson and A. Gruzd, "MOOCs - International information and education phenomenon?," *Bull. Assoc. Inf. Sci. Technol.*, 40(5), 35–40, 2014.

[16] Y. J. Joo, H. J. So, and N. H. Kim, "Examination of relationships among students' self-determination, technology acceptance, satisfaction, and continuance intention to use K-MOOCs," *Comput. Educ.*, 122, 260-272, 2018.

[17] M. T. Cole, D. J. Shelley, and L. B. Swartz, "Online instruction, e-learning, and student satisfaction: A three year study," *International Review of Research in Open and Distributed Learning*, 15(6), 111-131, 2014.

[18] D. Y. Jacobsen, "Dropping out or dropping in? A connectivist approach to understanding participants' strategies in an e-learning MOOC pilot," *Technol. Knowl. Learn.*, 2017, 1–21, 2017.

[19] S. S. Noesgaard, R. Ørngreen, and K. Foundation, "The effectiveness of e-learning: An explorative and integrative review of the definitions, methodologies and factors that promote e-learning effectiveness," 13(4), 278–290, 2015.

[20] Y. Belanger, "Bioelectricity: A quantitative approach," Springer Science and Business Media, 2013.

[21] A. Brali, "Integrating MOOCs in traditionally taught courses: Achieving learning outcomes with blended learning," *International Journal of Educational Technology in Higher Education*, 15(1), 1-16, 2018.

[22] N. Gillani and R. Eynon, "Communication patterns in massively open online courses," *Internet High. Educ.*, 23, 18–26, 2014.

[23] M. J. Israel, "Effectiveness of integrating MOOCs in traditional classrooms for undergraduate students," 16(5), 102–118, 2015.

[24] P. J. Muñoz-Merino, J. A. Ruipérez-Valiente, C. Alario-Hoyos, M. Pérez-Sanagustín, and C. Delgado Kloos, "Precise effectiveness strategy for analyzing the effectiveness of students with educational resources and activities in MOOCs," *Comput. Human Behav.*, 47, 108–118, 2015.

[25] Open Learning, "What is OpenLearning?," 2018. https://www.openlearning.com.

[26] Udemy, "At Udemy, we're improving lives through learning," 2018. https://www.udemy.com/.

[27] M. Al-Atabi and J. Deboer, "Teaching entrepreneurship using Massive Open Online Course (MOOC)," *Technovation*, 34(4), 261–264, 2014.

[28] W. A. A. W. Daud, A. A. Rahman, A. Z. Amiruddin, A. T. Hassan, N. A. Rahman, and A. A. Hai, "Al-Munawwar via MOOC: A platform for learning Arabic language communication (level 1-beginner)," KNOVASI 2018, 2018.

[29] R. Robinson, "Delivering a medical school elective with massive open online course (MOOC) technology," *PeerJ*, 4, 1-9, 2016.

[30] E. Figueiredo, J. A. Pereira, L. Garcia, and L. Lourdes, "On the evaluation of an open software engineering course," *Proceedings of the IEEE Front. Educ. Conf.*, pp. 1–8, 2014.

[31] T. Brahimi and A. Sarirete, "Learning outside the classroom through MOOCs," *Comput. Human Behav.*, 51, 604–609, 2015.