

A Review Paper on MOOCs Development Stages, Types, and Opportunities and Challenges

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Abstract

Human technology interaction became the key driver for bringing new changes that improve the life wellbeing and solve society problems. Past studies paid a considerable attention in technology in manufacturing, but recently due to the repaid growth of service sector, technology developers targeted this sector, especially the profitable businesses. However, the social business such as education, has not received adequate attention. Even though e-learning and MOOCs application introduced to solve institutions' capacity and boost up their quality, the efficiency of using these technologies is questionable since less than 10%, who use MOOCs complete their courses. The literature suggests that technology motivation factors that influence users and educational quality as well as system are important to address this challenge. Even though, many studies investigated these factors, the problem still existed. Thus, this review paper aims to highlight and investigate the development process of MOOCs and their opportunities as well as challenges. The finding of this paper suggests that even though MOOCs adoption and operation are suffering of several issues, which should be addressed by future research, MOOCs are the future promise for education development.

Keywords: MOOCs, Development, Stages, Types, Opportunities, Challenges

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INTRODUCTION

Over time, researchers and educators have been intrigued by technological potential to transform education and increase learning among students (Popel & Shyshkina, 2019). One is to use the Internet for courses commonly referred to as e-learning. E-learning has undergone several practises in recent years (Tarus, Gichoya, & Muumbo, 2015). Initiatives, especially on learning environment (Kassim, Salleh, Zainal, & Husin, 2017). The Massive Open Online Courses (MOOCs) are a specific initiative that is becoming more popular with educators, teachers and students. The MOOC initiative can be part of a larger open education framework that is typically defined as digitised materials, free and open to the public. Reuse for education, education and research' (OECD, 2005). George Siemens and Stephen Downs used the term MOOC in 2008, particularly because Sebastian Thrun, a Stanford teacher, gave free (2013) courses on the artificial intelligence (Hu, for example). All people with internet connexions can mainly take part in a MOOC to access the resources available and communicate with other students. (Bonk et al., 2018). Usually high MOOC registration numbers, with over 500 participants (Pilli & Admiraal, 2016). Universities offer MOOCs with partners like Coursera and Udacity in general. Curser is the fastest growing MOOC provider and has 2,8 million students, registering 1.4 million course registrations monthly, with more than 30 university partners including

Princeton, Brown, Columbia, Duke, Stanford and Johns. MOOC advocates think it can offer educational benefits to institutes of higher education, teachers and students. Some believe, for example, that the latest democracy in education

is MOOCs, making education as accessible to as many as possible. (C. Chen, Sonmert, Sadler, Sassselov, & Fredericks, 2020; Hew & Cheung, 2014). The majority of participants are free to register for MOOCs without charge and, in some cases, for a certificate of completion a small or nominal fee. Others believe MOOCs will increase an institute's reputation or market themselves to potential students, teachers and donors, and allow teachers to experiment with online learning pedagogy (Hew & Cheung, 2014). Sceptics, on the other hand, are worried about the provision of watered-doo education by MOOCs, the possibility of damage to less prestige colleges and more cuts in government school budgets (Kizilcec, Pérez-Sanagustín, & Maldonado, 2017). A buzz and demand for MOOC's were generated by current famous talk in the mass media, despite the debate between MOOC advocates and sceptics (Aparicio, Oliveira, Bacao, & Painho, 2019). It can be concluded that even though many studies have discussed MOOCs applications and effects, the literature still lacks of sufficient body of knowledge about MOOCs types and how they work and why they are important. Therefore, this review paper aims to discuss the related work on MOOCs, specifically on development stages, types, and opportunities and challenges.

MOOCs DEFINITION

MOOCs concepts were created to facilitate the open courseware (OCW) and open educational resources (OER) (Atiaja & Guerrero-proenza, 2016). The creativity of OCW, which is "digital publication for educational materials courses with high-quality provided free" ("Giving knowledge for free: The emergence of open educational resources," 2007; Proceedings, 2018), was launched in 2001 in the

Massachusetts Institute of Technology (MIT) (Atkins, Seely Brown, & Hammond, 2007). Meanwhile the OER is known as “Digitized content freely and publicly accessible to instructors, students and self-learners for use and reuse in education, studying and study” (“Giving knowledge for free: The emergence of open educational resources,” 2007). The OER resources can be 'Free software tools, free courses and materials, archives for learning objects (e.g. applications for learning management). (3) Open e-learning capability structure with free materials for students and staffs. There are many characteristics whereby both MOOCs and OCW are sharing (Downes, 2007). Currently, open resources and courses are offered by various colleges and they are accessible to the general population around the world. Then again, MOOCs are classified as online courses designed for large numbers of participants, available to anyone everywhere as long as you have an internet membership, are open to anyone without the possibility of passageways and offer a complete / total online course meeting for nothing. (Jansen & Schuwer, 2015). Even though both of OCW and MOOCs share some characteristics, Table there are differences between them as shown in Table 1 (Martinez, 2014).

THE DEVELOPMENT OF MOOCs

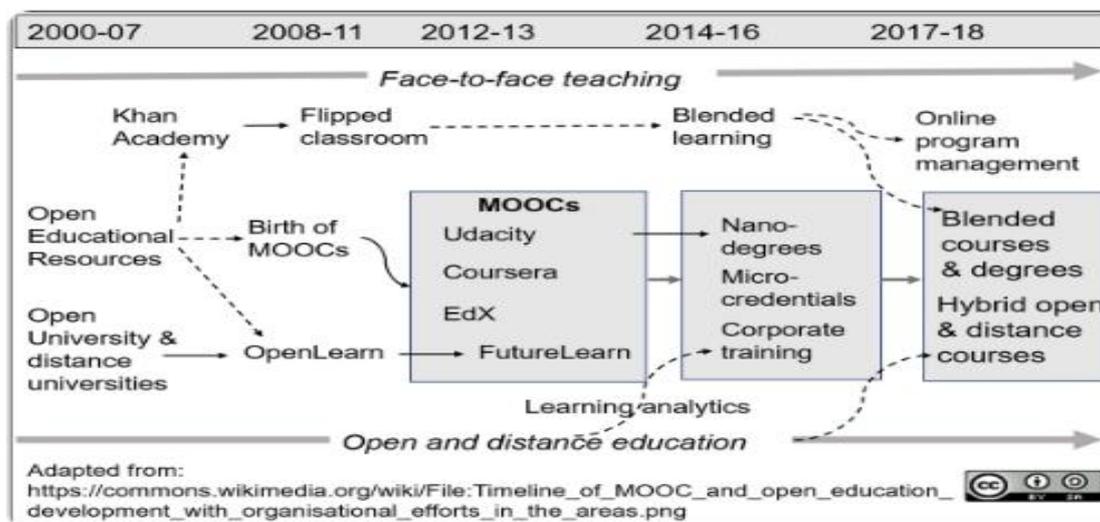
David Cormier developed an educational breakthrough called 'MOOCs' in early 2008 to enable Siemens and Downs to begin an open-line course on 'MOOCs' (Baker,Layne, 2015; Sonwalkar1, 2015). More than 2300 students who entered the open course without charge fascinated. (Sonwalkar,Maheshkar, 2015). The second MOOC in 2011

2012). As the popularity of MOOCs, Daphne Koller and Andrew Ng established 'Coursera' as a company with aiming at providing an education with high quality to attract students around the world (Brahimi & Sarirete, 2015). edX is another MOOC plat form developed by MIT and Harvard University with social mission of offering free online courses (Wakefield et al., 2018). In addition, 'Sebastian Thrun with David Stavens and Michael Sokolsky developed Udacity' MOOC (Pappano, 2012) And the Open University has launched Future Learn to deliver free online courses commonly used by many UK leading universities. (Liyaganawardena, Adams, & Williams, 2013).

Table 1. The differences between OCW and MOOCs (Martinez, 2014).

OCW	MOOCs
Materials for courses	Completed materials and courses
Static	Dynamic
Accessibility is always	Accessibility is limited in time of opening courses
Without assessment	With assessment
Without accreditation	With accreditation
Individual	Cooperative

Open Education and MOOC use has been rising steadily since 2008, as shown in Figure 2.1. (Powell, 2018). In 2017 it has been reported that in more than 700 colleges nearly 6,850 courses were offered. (Shah, 2016a). Between 2012 and 2017, MOOCs grew rapidly as shown in Figure 2.2.(Shah, 2016a). In 2016, a total of 58 million students



was added to the Artificial Intelligence Prolog, choosing over 160,000 understudies. (Brahimi & Sarirete, 2015) Professor Sebastian Thrun, Stanford Educator and Google Research Chief Peter Norvig were ranked (Atiaja & Guerrero-proenza, 2016) And MOOC was demanded in 2012 (L Pappano,

enumerated in at least one course, as announced. (Shah, 2016a). These MOOCs are now experiencing exponential growth with users hitting almost 23 million, and the most impressive MOOCs as far as their registered customers are concerned. (Shah, 2016a).

Figure 1. Open Education Development Overtime (Powell, 2018).

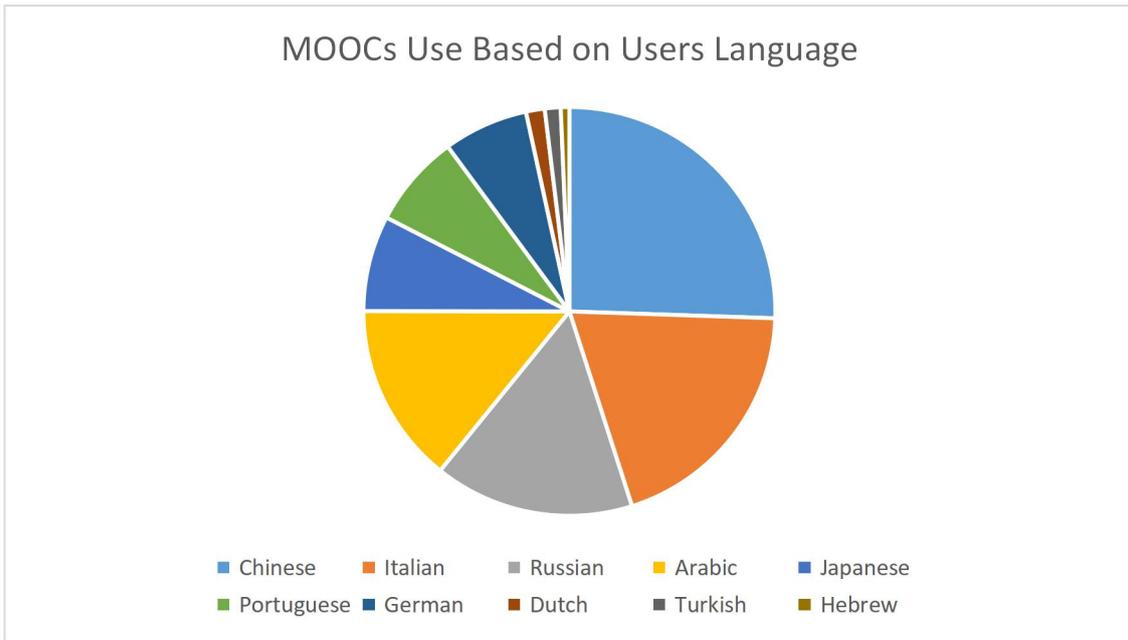


Figure 2. MOOCs Users' Language (Class Central, 2017)

MOOCs BASED ON LANGUAGE USE

The key providers of courses offered separately for the quantity of courses delivered are Future Learn, Mirada X, EdX, Xuetang X with the numbers 1700 +, 1300, 480, 350 & 300 + (Shah 2016a). The majority of MOOC courses are offered in 3 primary dialects: English, French and Spanish with the following dialects: 6287, 323 and 634, different (Central Class 2017). In more than 15 specific dialects, numerous courses are currently opened as shown in Figure 2 (Class Central, 2017).

TYPES OF MOOCs

The two primary, separate types of MOOCs, according to their pedagogical existence (Yousef, Chatti, Schroeder, Wosnitza, & Jakobs, 2014) have currently been widely adopted as 'cMOOC' and 'xMOOCs.' First, cMOOCs (MOOCs), in which knowledge and material from supporters are generated as they evolve during the training course, are involved in education focused on social networking (Z. Wang, Anderson, Chen, & Barbera, 2017). One of cMOOC 's

strengths is the versatility by which students can monitor the course by specifying course goals, conduct ingredients, exercises and arrogate data to various participants (Bakki, Oubahssi, George, & Cherkaoui, 2019; Skrypnyk, Joksimović, Kovanović, Gasšević, & Dawson, 2015). MOOCs allow students through the advances Web 2.0, such as Facebook, websites and Google meetings to share the materials and information with their team. There is no official evaluation of cMOOCs; wiki; however, informal feedback can be received or self-assessment by the participants (Aparicio et al., 2019; Pilli & Admiraal, 2016). Instances of cMOOCs include CCK117, PLENK6 (Internet knowledge, personnel training environments), CMOOC8, etMOOC9, etc. (Yeager, Hurley-Dasgupta, & Bliss, 2013) Instances, CCK115 (Connectives and Connective Knowledge As shown in Figure 3, cMOOCs provide an effective dynamic interacted between network, self-organized and connection to ensure the quality of online education through flexibility in content distribution, students communication and variety of assessments

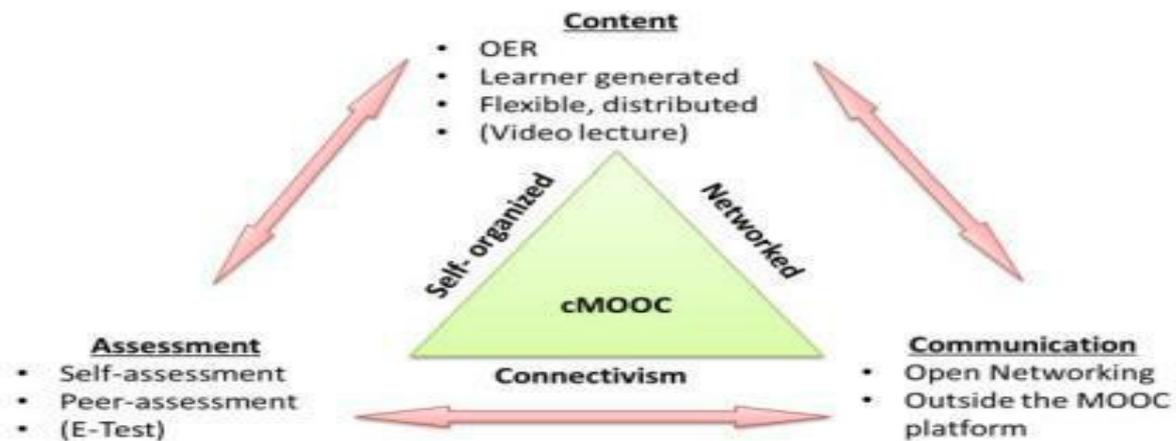


Figure 3. Main models of cMOOCs (Yousef et al., 2014).

Contrary to cMOOCs today's MOOCs from the central market are called advance MOOCs and based on cognitivist learning / conduct (Lin, 2017; Luo, Zhou, Li, & Xiao, 2018) supplied by contractors such as Coursera, Udacity, edX etc. (MOOCs). xMOOCs are instead official courses, which are also organised for regular academic courses, which include content-based lectures, video addresses, tests, and tasks as the main learning exercises. xMOOC teachers assume that the content of courses, the objectives of courses and student surveys play an important part (Janssen, Nyström Claesson, & Lindqvist, 2016). Teachers between students in xMOOCs normally arise in an integrated the forum conversation in the platform of the course. Students are assessed by the teachers

of the courses through diverse approaches such as quizzes, assignments, multiple-choice tests, and peer valuation via rubrics developed by the instructors (Cinquin, Guitton, & Sauzeon, 2019). As described by xMOOCs in (Yousef et al., 2014), three key components are content, evaluation and communication, in which the various components are effectively and jointly used to achieve learning results as illustrated in Figure 4. MOOCs, like mixed MOOCs (bMOOCs) which combine face-to - face and linked online communications and sMOOCs, are also available innovatively, known as open-ended, small-scale online courses with a relatively small number of consumers (Yousef et al. 2014).

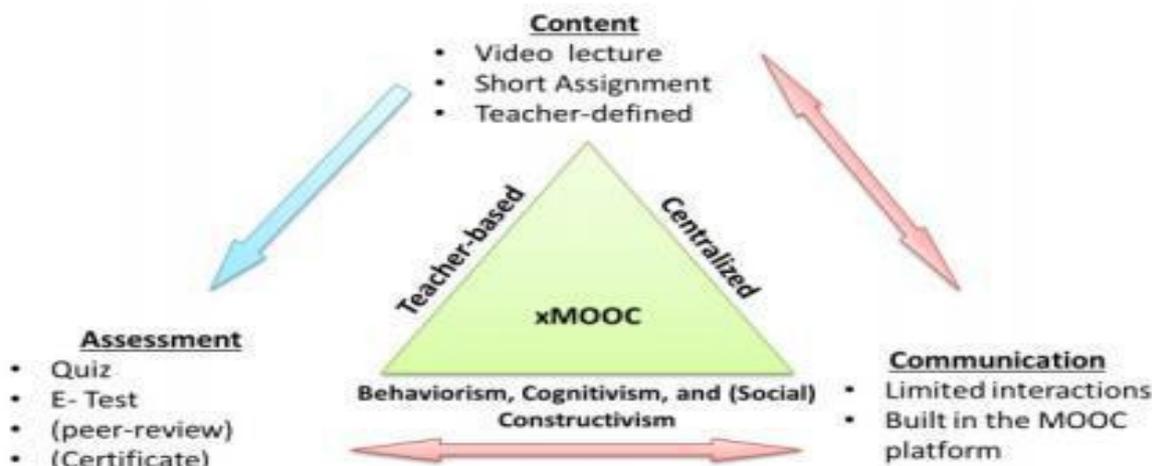


Figure 4. Key models of xMOOCs (Yousef et al., 2014).

PEDAGOGY IN MOOCs

The pedagogy of (Mohamed & Hammond, 2018; Pundak, Sabag, & Trotskovsky, 2014), are usually extremely dependent on the following requirements. Next, a curriculum: lessons and exercises to the learning result. Secondly, video and interpretations: these materials are often archived in xMOOCs, and in cMOOCs managers invit or transmit a presentation to a guest teacher regularly. Thirdly, forums are used for interfaces for learning. In xMOOCs central forums are commonly used, while free spaces (wiki, blogs, Facebook pages etc.) are used for cMOOCs. Fourthly, jobs, exams and projects: they are used for testing by apprentices; they can contribute to certification. The video of the readings normally lasts about 5-15 minutes. However, there are recordings which last for an hour or more. In a lecture, questions are posed to assess the interpretation of the points addressed in the speech by the students. Similarly, one week after the event, understudies often obtain a big evaluation mission. A gigantic number of students typically participate in a course that is normally taught by a central instructor or speaker and 2-3 other teaching aids. The majority of MOOCs actually follow a rigorous schedule, which ensures that they must complete their courses on time week after week in order to complete their courses effectively. Conversely, autonomous courses are adaptable and do not exceed due dates. But such adjustment can easily delay work (Pundak et al., 2014). The evaluation of

may has the ability to gain a certificate (Yu, Miao, Leung, & White, 2017).

MOOCs' ADVANTAGES AND WEAKNESSES

MOOCs hold unique attributes, which they know through the regular online courses. The next highlights are the qualities which separate MOOC learning. (Badi & Ali, 2016), stated that the features of MOOC innovations changed education learning process significantly through: first, massiveness: the stages are multipurpose where the courses can reach a large number of students and participants. Second, transparency, if the courses offered are available to anyone who is interested, free, unobliged or previously conditional, at anytime and anywhere. Third, diversity Assorted (heterogeneity): members come from diverse cultures, backgrounds and have diverse inspirations.

Therefore, MOOCs have been acknowledged as the key drivers for future learning because of the following advantages: first, MOOCs offer a wide range of benefits including including the improvement of students competencies both knowledge and skills which in improve their lifelong learning. Second, MOOCs offers cloud learning

countless stances one of the difficulties of MOOCs, and can be comprehended by the accompanying methods: automatic test using closed questions; peer assessment; test through AI (Pundak et al., 2014). After finishing the course, a student

room where students can exchange their knowledge, opinions and discuss their issues with others who are specialists or interests in their learning community (Donitsa-Schmidt & Topaz, 2018). Third, MOOCs continue offering a high quality of learning activities and courses and many professionals are now used it worldwide, which helps to overcome the physical interactions restrictions, (Kaplan & Haenlein, 2016). Fourth, MOOCs show their important in dealing with uncertainty. For example, in the period of Covid19 where many educational institutions shutdown through eliminating physical interaction restrictions, managing time effectively and efficiency use resources (Evans, Baker, & Dee, 2016). They also offer internationalization advantage through enabling knowledge transfer and sharing between their members from many countries (Luetkehans, 2016).

The completion of MOOCs depicts a condition in which a learner satisfies all of the course requirements or, apparently, receives the endorsement. Regardless of the expansive number of students who agree to accept MOOCs, some 7-10 per cent of them complete courses (Z. Chen, Demirci, Choi, & Pritchard, 2017). This situation was reported by (Clow, 2013) who proposed the notion of a 'funnel of engagement' as seen in Figure 5.

Figure 5. The funnel of participation (Clow, 2013 p.186)



The small success ratio is due to the variety of students' motivation to study (Greene, Oswald & Pomerantz., 2015). Similarly, the lack of motivation is one of the motives which leaves little involvement (Fini, 2009). The achievement ratio may not be an acceptable means of measuring the achievement of MOOCs (Jordan, Katy (Open University, 2014) due to not everyone needing to finish their class (Y. Wang & Baker, 2015), and to a certain number of participants who want only to gain from the sections of the course (Horton-Tognazzini, 2015). The low achievement proportion is credited to the diversity of inspirations of students to enroll in the courses (Greene, Oswald & Pomerantz., 2015). Likewise, single of the motives that drives to little involvement proportion is lack of motivation (Fini, 2009). Accomplishment proportion may not be a suitable method to analyses MOOCs achievement (Jordan, Katy (Open University, 2014) owed to the fact that not all students need to finish the course (Y. Wang & Baker, 2015), and a definite number of members merely want to get advantage from portions of the course (Horton-Tognazzini, 2015). Nonetheless, examining the achievement situation would enable us to improved comprehend MOOCs and current matters (Ouyang, Tang, & Rong, 2017).

Despite, the benefits of MOOCs implications to the development of education system, they are not ammine of several limitations, which affect the quality of education. for example, the interaction between lecturers and students fact

to face is limited, which may affect the delivery of knowledge and results negatively in knowledge absorptive capacity by students (Li, Tang, Cao, & Hu, 2018), Scientific methods in particular. Second, student-director interactions should be timely in order to react to feedback and concerns in real time, however with MOOCs the issue persists because of the overwhelming student-teacher ratio of one single curriculum. (Atiaja & Guerrero-proenza, 2016). Third, MOOCs still have a big challenge in reaching the maximum number of users and the dropout rate is high (Al-Shami, Sedik, Rashid, & Hussin, 2018b), compared to these who finished their courses with percentage ranking between 5-15% (Xing, Chen, Stein, & Marcinkowski, 2016). Fifth, most of MOOCs implications and platforms have limited option in language use, where mostly use English. However, the majority of student's worldwide are using their mother language (Cho & Byun, 2017). This adds another challenge to the designers and educational institutions. In addition, MOOCs' developers designed the features of MOOCs to overcome destination barriers between lecturers and students, but most of the resources are not well matched with students, especially for listeners (Amado-salvatierra, 2017). Six, there are another technical issues such as authentication which leaves a challenge in coordinating and controlling students and ensuring that these who takes online test is the same student who enrolled in MOOCs' course (Al-Shami, Sedik, Rashid, & Hussin, 2018a; Sonwalkar1,*, 2015). Seven, many of companies and educational institutions are profit base and their standards may not be up to the quality, which leaves anxieties about the credit of certificates (Garrido, Koepke, Andersen, & Garrido, 2016). Finally, MOOCs educational system is heavily relied on self-motivation rather than institutional processes and system. This may affect the incentive to finish the courses since mostly are self-orientations (Barak, Watted, & Haick, 2016).

MOOCs MOTIVATIONS

This review paper discuss definition and the importance of MOOCs along with the types and challenges. The finding of this paper suggests that participation in MOOCs allows students to exchange their expertise with other participants, lecturers and course material (Pilli & Admiraal, 2017). This improved the quality of education in both high-education and students, which stimulates others to choose MOOCs and take an interest in courses. Despite the nature of the learning resources, the genuine constraint for learners isn't receiving to those resources, but on their motivation to participate in learning courses (Zhou, 2016). It may due to inspirations are the driving force behind the behavior and determination of users (Wu & Chen, 2017). Basically, numerous researchers have stated that the motivations of learners to use MOOCs are predominantly related to their obligation and repetition use MOOCs (Bosch and Cruces, 2015). Therefore, inspiring

learners play a crucial role in increasing the MOOCs retention (Hone & Said, 2016). Through MOOCs, learners can show a wide range of motivations, which are the results to drive them to use MOOCs through permitting varied students to participate in MOOCs (Alario-Hoyos, Estévez-Ayres, Pérez-Sanagustín, Kloos, & Fernández-Panadero, 2017). This was one of the reasons that push learners to enroll in MOOCs and selected them as their web based learning as reported by past studies (Alario-Hoyos et al., 2017; Eglloffstein & Ifenthaler, 2017). The expenditure of developing highest notch phases with an extensive range of diverse topics ranging somewhere between 60 and 100 million dollars (Mutawa, 2017). Consequently, it turned out to be important for MOOC vendors, experts, and strategy developers to consider the convincing variables that influence students on their continued use of MOOCs (Ouyang et al., 2017). Examining such inspirations provides the suppliers of MOOCs with a bit of knowledge of conceivable responses to enhance the MOOCs meeting for all students in order to build on their commitment, fulfillment (Gameel, 2017; Junjie, 2017) and potential standards of completion or consistency (Xiong et al., 2015).

CONCLUSION

The aim of this paper was to discuss the related work on MOOCs, specifically on development stages, types, and opportunities and challenges. Based on the discussion, we find that even though there are differences in the functions and features between cMOOCs and xMOOCs, both of them are important to improve the quality of education. The literature therefore, to avoid the bias of integrating both subjective and objective measurements such as both types in one mobile, the future research should evaluate the motivation factors based on specific type of introduce the type as a moderate factor. The quality interaction between the lecturers and their students as well as between students themselves heavily depends on three important factors which as quality system technology of MOOCs platforms, quality of the education, which include lecturers' capability, materials use and delivery and finally students awareness and intention. Therefore, these three factors leave a room for future research to explore further about how to improve MOOCs operation and adoption.

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