

Systematic Review Of A Nationwide MOOC Initiative In Malaysian Higher Education System

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Abstract: The purpose of this study is to analyze and synthesize the recent research related to nationwide MOOC initiatives in Malaysian higher education that have been published from 2014 to 2018 in order to gain an overview of the growth of MOOC in Malaysia and to identify the issues facing implementation of nationwide MOOC initiatives in the Malaysian higher education context. This study utilized a descriptive systematic literature review (SLR) approach using systematic content analysis techniques to compile and analyze publications related to nationwide MOOC initiatives in the Malaysian higher education system. The 25 MOOC studies reviewed are categorized into three sections: Malaysia MOOC, followed by a summary of researches relevant to Malaysia MOOC and finally, issues of the nationwide MOOC implementation in Malaysia. Several recommendations are provided to expand MOOC's nationwide initiative in Malaysian higher education systems. The significance of the paper is twofold: (a) to inform researchers, designers, and teachers, about the state of the art of nationwide MOOC initiative in Malaysia; (b) to provide suggestions for adapting the nationwide MOOC initiative in Malaysian higher education system and other countries sharing similar interests in institutionalizing their MOOC.

Keywords: Higher education; Malaysia; MOOC; Massive Open Online Courses.

1. Introduction

Massive Open Online Course (MOOC) provides free online learning which has the vital ability to provide courses to a huge number of interested learners worldwide. It delivers opportunities that open up learning and provides a range of choices for a massive number of participants all over the world to attend free online courses without any admission requirement in different areas and disciplines (Liyanagunawardena, Adams, and Williams, 2013). MOOC is a platform for communication and collaboration where the participants can exchange information and enhance their knowledge (Albelbisi, 2020). Therefore, MOOC has received significant attention in higher education literature (e.g., Bates, 2014; Pence, 2012).

MOOC provides free, high quality classes to students anywhere in the world (Haynie, 2013). It has the potential to change the teaching and learning pathway in higher education (Friedland, 2013) as it makes high quality education more accessible and decreases the costs of higher education (Carey, 2012; Lewin, 2012).

The Malaysia Ministry of Education has recently initiated Malaysian MOOC as a new learning trend. Malaysia's MOOC is still in its growing phase and very little research has been focused on the issues and challenges facing implementation of MOOC in the higher education sector in Malaysia. To fill this gap, this paper presents results of a systematic literature review to explore the growth of MOOC in Malaysia and issues regarding its implementation in the Malaysian higher education system.

1.1 Purpose of the study

The purpose of this study is twofold. First, it aims to provide an overview of MOOC in the Malaysian higher education context and identify issues faced in its implementation. Second, it seeks to gain an overview of the growth of MOOC researches in Malaysia by examining existing literature related to Malaysia's MOOC initiative.

2. Literature review

2.1 History of MOOC

Massive Open Online Course or MOOC was first introduced by George Siemens and Stephen Downes as they were building a course format to fit with the theory of connectivism. This course came to be known as Connectivism and Connective Knowledge (CCK), which was held for the first time in 2008 and offered by the University of Manitoba. Dave Cormier first used the term MOOC as an acronym in 2008 to describe these online courses (CCK) (Bates, 2014; Yuan and Powell, 2013).

This new form of learning and teaching provided by MOOC has encouraged Stanford University to offer MOOC. In 2011 Sebastian Thrun, a professor at Stanford, and Peter Norvig, the Director of Research at Google, opened access to their Stanford course "Introduction to Artificial Intelligence" (CS 271) (Ministry of Education Malaysia, 2015). Driven by the success of the Stanford MOOC, Thrun and Norvig started to think about MOOC business models and launched Udacity as a for-profit MOOC model in 2012 (Peter and Deimann, 2013). In 2013, universities from the United Kingdom opened their own MOOC platform FutureLearn. Additionally, Massachusetts Institute of Technology (MIT) and Harvard University launched edX as a non-profit MOOC platform.

Today, MOOC has attracted millions of learners around the world. In 2016, over 23 million students signed up for at least one MOOC, taking the total number of learners to 58 million, the total number of MOOC courses for 6,850 offered by over 700 universities (Shah, 2016).

In recent years, nearly 60 open universities around the world enroll more than 17 million students (Guri-Rosenblit, 2012; Lockwood, 2013; Wikieducator, 2014). In fact, a few of them, Indira Gandhi National Open University in India, Anadolu University in Turkey, and Allama Iqbal Open University in Pakistan, alone have enrollments that reach into the millions (Bonk et al.2015). Other universities began accepting MOOC for credit with faculty approval or completion of an assessment examination given by the university itself in order to receive credit there (Albelbisi, Yusop, and Salleh, 2018). The University of Helsinki, Finland, is one institution employing this model (Kurahila, 2012).

On the other hand, many countries around the world have launched their own MOOC platforms (Shah, 2017). Each country tries to strengthen its MOOC by providing the ability to cover different subjects to attract massive numbers of participants. For example, Jordan launched in May 2014, a non-profit Arabic platform for MOOC called Edraak meaning "realization" in Arabic. Edraak has more than one million registered learners (Shah, 2017). Today, MOOC has a widespread system aimed at offering high quality education to interested learners all over the world (Schuwer and Janssen, 2013).

2.2 MOOC Implementation in Higher Education

MOOC studies suggest that universities should consider the potential influence of MOOC in improving knowledge, and grabbing the opportunities of MOOC to build learners' experiences (Barber, Donnelly, and Rizvi, 2013). MOOC experts emphasized that MOOC is one of the most interesting and challenging transformations occurred in higher education systems in years (Fonseca, 2014) and has the ability to enhance both academic and skill-based learning (Albelbisi, 2019; Miller et al. 2014).

However, other studies have highlighted that MOOC cannot yet completely replace traditional education (e.g. Bates, 2014). A study by Ovaska (2013) has revealed that there are few empirical evidences for the supposition that MOOC leads to improved quality in higher education (Jung, 2016). McGhee (2012) and Haggard (2013) have also highlighted some MOOC challenges related to its scalability, sustainability, and educational quality. They indicate the lack of a workable business model as one of the biggest challenges. These challenges should be considered in order to successfully implement MOOC.

On the other hand, the literature indicates that MOOC is a recent initiative in South East Asia (Hara, Moskal, and Saarinen, 2013; Manalo, 2014) and participation in MOOC from developing world regions such as Africa and Asia is relatively sparse when compared with the vast participation from North America or Europe (Liyanagunawardena, Adams and Williams , 2013).

2.3 Overview of MOOC Implementation Initiatives in Malaysia

The literature indicates that introducing MOOC in Malaysia is relatively recent ((Norazah, Helmi, and Mohamad Amin, 2016). The Ministry of Higher Education (MOHE) has been very proactive in initiating and overseeing MOOC implementation at Malaysian public universities since 2014 (Ghaffar et al., 2016). To date, all 20 public universities in Malaysia have their own MOOC courses made available to all Malaysians as well as people around the world.

In an effort to continuously improve the educational system, the Ministry of Higher Education (MOHE) has given serious attention to reforming higher education by launching its own Malaysia Education Blueprint for Higher

Education (2015-2025) in 2015 (Ministry of Education Malaysia, 2015). The blueprint outlines ten shifts that will become catalysts to reform Malaysian higher education, namely:

- Shift 1: Holistic, Entrepreneurial and Balanced Graduates that will enable Malaysian youth move from being job seekers to becoming job creators by enhancing the student learning experience, developing more holistic and integrated curricula, and creating opportunities for students and academic staff to acquire entrepreneurial skills;
- Shift 2: Talent Excellence that aims at preparing higher learning institutions for institutional excellence by providing best practice guidelines for talent recruitment and development;
- Shift 3: Nations of Lifelong Learners that aims at maximizing individual potential by providing ample reskilling and upskilling opportunities for Malaysian youth;
- Shift 4: Quality Technical and Vocational Education and Training (TVET) graduates which will be strengthened by increasing industry involvement and partnerships, and developing more efficient coordination across the Ministry's TVET providers;
- Shift 5: Financial Sustainability in which higher learning institutions are encouraged to expand their funding sources to reduce the dependency on government resources and to reform existing student financing mechanisms;
- Shift 6: Empowered Governance that aims at empowering higher learning institutions by delegating some of its decision-making power to the institutions;
- Shift 7: Innovation Ecosystem in which the Ministry will create a supportive environment where academia, industry, government, and local communities, come together in partnership for innovative development and marketing of ideas;
- Shift 8: Global Prominence in which Malaysia aims to become internationally recognized for its academic and research expertise;
- Shift 9: Globalized Online Learning aims at offering more personalized learning experiences for all students by utilizing technology-enabled innovations; and
- Shift 10: Transformed Higher Education Delivery aims at harmonizing Malaysian higher education system to focus more on delivery, accountability, transparency, and outcomes.

The full utilization of MOOC has been recognized, especially in the ninth shift of the blueprint. The blueprint (Ministry of Education Malaysia, 2014) indicates that MOOC as an online learning approach can offer an interactive and engaging delivery, which increases the levels of collaboration and international interactions (Mohamad and Rahim, 2018).

Consequently, the Ministry outlined three key initiatives to initiate the efforts for MOOC, creating a national e-learning platform called Malaysia MOOC and enhancing existing administrative structures, including its academic capabilities and cyber infrastructure (Ministry of Education Malaysia, 2015). Malaysia's intention to leverage MOOC is stated to be a way to improve the quality of learning and to extend Malaysian access to education (Ministry of Education Malaysia, 2014). A total budget of MYR 500 million (USD138.6 million) has been proposed to support this initiative through the upcoming 11th Malaysia Plan, 2016-2020 (The Star, 2014).

The top-down approach to MOOC development in Malaysian higher education is an interesting phenomenon as it shows the government's determination to make quality tertiary education available and accessible to all Malaysians regardless of their geographical locations and previous secondary education.

3. Methodology

This study employs a descriptive systematic literature review (SLR) approach using systematic content analysis techniques to examine data found in published articles in systematic manners and to provide a suitable summary of the studies on a specific issue (Petticrew and Roberts, 2008).

The content analysis method is used to analyze and synthesize publications related to MOOC in Malaysia, which will fulfill the purposes of study, which is to provide an overview of nationwide MOOC initiatives in the Malaysian higher education system and identify issues faced in its implementation and to gain an overview of the growth of MOOC researches in Malaysia.

The literature search was done through the following criteria:

- First, eight search terms have been chosen to identify potential literature. They are “MOOC”, “MOOCs”, “Massive Open Online Courses”, “higher education”, “Malaysia”, “advantage”, “challenges”, and “opportunity”.
- Second, the terms have been employed to search in two major refereed academic databases, Web of Science, Scopus, and one additional database, Google Scholar search engine.
- Third, only articles published from 2014 to 2018 have been selected because 2014 is the beginning year of the nationwide MOOC initiatives in Malaysia.
- Fourth, only papers written in English have selected because the two major databases used in this study are publishing papers in English.

A more comprehensive analysis has been undertaken based on the five-stage methodology by Khan, Kunz, Kleijnen, and Antes (2003). This technique has been chosen as a systematic analysis method to analyze and organize the literature related to MOOC in Malaysia into meaningful and useful manners. The five-stage methodology is: 1) Setting questions for the review, 2) identifying relevant studies, 3) evaluating quality of identified work, 4) summarizing the evidence, and 5) interpret the findings.

Stage 1: Set question for the review:

The key research question explored in this study is: What are the issues facing implementation of MOOC initiative in Malaysian higher education systems.

Stage 2: Identify relevant studies:

The aim of this is to identify as many relevant papers as possible from the databases selected (e.g., Scopus) within the period between 2014 to 2018. By browsing the search terms chosen (e.g., MOOC, Malaysia) the search resulted in a selection of 76 articles.

Stage 3: Assess quality of identified work:

In this phase, the articles that met the previous criteria and related to the nationwide MOOC initiatives in the Malaysian higher education system have been selected based on the articles’ titles and the information presented in their abstracts. From the pool of literature 41 studies met the criteria, however, 11 articles not related to the aims of this study have been eliminated. As a result, 30 studies papers have been read in detail and selected for the fourth stage.

Stage 4: Summarize evidence:

At this stage, the authors of this study have examined the full papers separately and discussions have been held when there were inconsistencies.

Stage 5: Interpret the findings

This stage presents the results of analyzing and synthesizing the data obtained from a set of selected studies. The process resulted in the final set of 25 studies that were involved in the analysis. These 25 papers have been categorized into three sections: Malaysia MOOC (5 papers) followed by a summary of research related to Malaysia MOOC (12 papers) and finally, issues of the nationwide MOOC implementation (8 papers). Table 1 displays the classification of the studies that are included in this review according to the themes (categories).

A PRISMA technique by Moher, Liberati, Tetzlaff, Altman, The PRISMA Group (2009) has been utilized for the search procedure. Figure (1) displays the PRISMA flow diagram of articles relevant to nationwide MOOC initiatives in the Malaysian higher education system.

Table 1: Classification of the MOOC studies into three categories

Categories	MOOC studies	No. of study
Malaysia MOOC	Azizi (2017); Shahar (2016); Nor Fadzleen (2014); Ab Jalil, Ismail, Bakar, Azizan, & Nasir (2016); Dahlan, Juhari, & Shafiee (2015).	5
Researches related to Malaysian MOOC	Al-Atabi, & DeBoer (2014); Nordin, Norman, & Embi (2015); Mansor, Latifah, & Amrina (2015); Nor Fadzleen, Rose, & Naoki (2015); Badusah, Norman, Mohammad, Nordin, & Kamrozzaman (2016); Nordin, Embi, & Norman (2016); Nordin, Norman, Embi, Mansor, & Idris (2016); Ghazali & Nordin (2016); Goh, Wong, & Ayub (2018); Mat-jizat, Samsudin, & Yahaya (2014); Zulkafli & Mohamad (2018); Jamaluddin (2018).	12
Issues of the nation-wide MOOC implementation.	Ghaffar, Yusop, Sulaiman, Hassan, Hamzaid, Firdaus, & Hassim (2016); Kumar & Al-Samarraie (2018); Mohamad & Rahim (2018); Ayub & Leong (2017); Al-shami, Sedik, Rashid, & Hussin (2018); Tharmabalan (2016); Wilshire (2015); Azhan, Saman, & Man (2016).	7

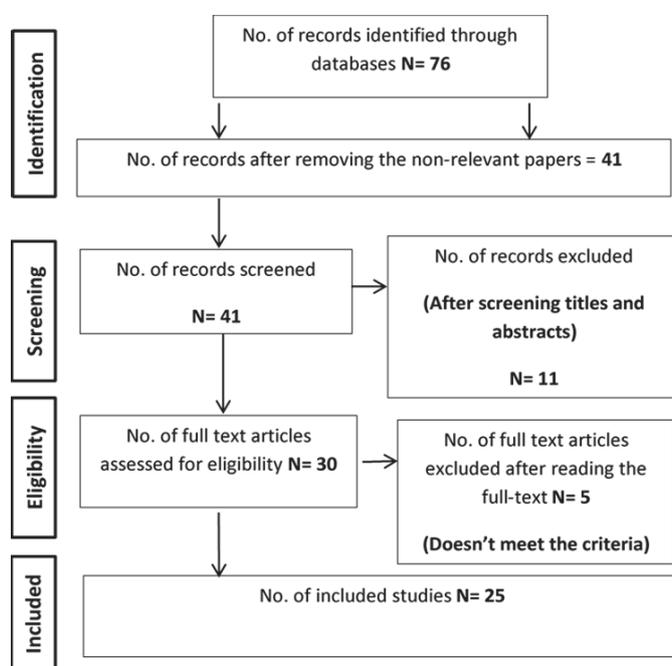


Figure1: The PRISMA flow diagram for analyzing articles related to MOOC in Malaysia

Application of this 5-stages systematic analysis procedure resulted in an examination of journals, books and online articles related to nationwide MOOC initiatives in the Malaysian higher education system.

This analysis of the MOOC studies was conducted from year 2014 to 2018, and the collection of the papers sorted by publication year as display in Figure 2.

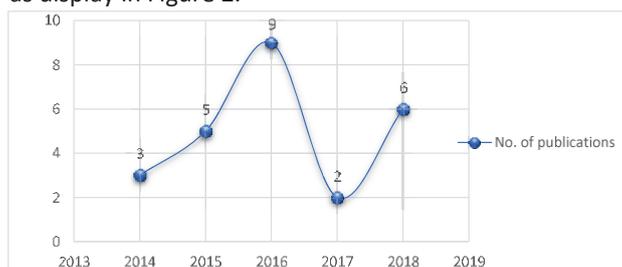


Figure 2: Distribution of Malaysia’s MOOC articles by publication year

4. Findings

This section presents Malaysia MOOC, followed by a summary of research related to Malaysian MOOC, and finally, issues of the nationwide MOOC implementation.

4.1 Malaysia MOOC

Following the educational blueprint, Malaysia MOOC has launched on a national scale by the Higher Education Minister on 18th September 2014 (Ministry of Education Malaysia, 2014). Four public universities have been involved in the first phase of MOOC development in Malaysia: Universiti Putra Malaysia (UPM), Universiti Kebangsaan Malaysia (UKM), Universiti Teknologi Mara (UiTM) and Universiti Malaysia Sarawak (UNIMAS). The universities have offered four compulsory common courses for first year undergraduate students. The four courses are:

- Islamic and Asian Civilisations developed by UPM;
- Ethnic Relations developed by UKM;
- Entrepreneurship developed by UiTM; and
- ICT Competencies developed by UNIMAS.

All of the Malaysia MOOC courses are hosted on the OpenLearning platform, the official MOOC platform for all public institutions of higher education in Malaysia.

In this first phase, all Malaysia MOOC courses are developed to complement on-campus university classes. However, the courses are also open to non-registered students all around the world as non-credit courses (Azizi, 2017). As practiced by other universities offering MOOCs, students registered for these courses are not required to pay any fees but will be charged a small fee to get the certificate of accomplishment from the universities (Shahar, 2016).

A search on the OpenLearning.com website shows that the popularity of Malaysia MOOC grew rapidly over the last number of years in Malaysian higher education institutions (OpenLearning blog, 2017). Table 2 displays the progress report for OpenLearning in recent years:

Table 2: Number of students enrollment for OpenLearning courses between 2014-2016

Year	Student enrollment	New courses
2014	89,770	775
2015	184,002	1,851
2016	240,961	2,251
	Total 604,503	5,256

Source: <https://www.openlearning.com/blog/CompanyProgressReport201516>

Phase 2 of the initiative involves development of MOOC courses by all 20 public universities in Malaysia that are relevant to their institutional focus and interests (Nor Fadzleen, 2014), increasing the total number of MOOC to 64 (Wilshire, 2015). To spearhead the MOOC initiative, the Ministry has been providing seed funding for the universities' efforts since 2014. The funding has significantly increased the number of MOOC courses in Malaysia. Starting with only four pioneering common university courses taught at all public universities (Ghaffar et al., 2016), the number has progressively increased over the last 3 years with more universities taking part in the initiative including private universities such as the Open University Malaysia (OUM) and Taylors University. To date, Malaysia MOOC features over 241 courses with over 238,267 student enrollments (OpenLearning, 2017). Table 3 displays information related to the progress for OpenLearning.

Table 3: Number of students interaction, total hours spent, and total course completion rate in OpenLearning

Information	Number
Total student interactions	6,109,916
Total hours spent in OpenLearning	1,257,625
Total course completion rate	27.25%

Source: <https://www.openlearning.com/blog/CompanyProgressReport201516>

4.2 Researches related to Malaysia MOOC

The second part of the systematic literature review reveals that research on MOOC in Malaysian higher education context is still in infancy stage. This is evident in the limited number of research studies conducted on

the topic. Fortunately, the body of research has been progressively growing since 2014 when Malaysia MOOC first was initiated until now.

A closer examination of the articles using the Template Analysis approach was employed to identify themes in the textual data which have been organized in a template. As shown in Table 4, the research has been concentrated in two major themes: (1) MOOC acceptance: students’ and instructors’ perceptions toward MOOC courses, and (2) important aspects of MOOC delivery. Consideration of the use and delivery of MOOC among students and lecturers should be encouraged further to develop a better understanding of successful implementation MOOC systems (Wong, 2016).

Table 4: Classification of MOOC papers into 2 themes

MOOC acceptance	MOOC delivery
Al-Atabi, & DeBoer (2014);	Badusah, Norman, Mohammad, Nordin, & Kamrozzaman (2016);
Nordin, Norman, & Embi (2015); Nor Fadzleen, Rose, & Naoki (2015);	Nordin, Embi, & Norman (2016);
Mansor, Latifah, & Amina (2015);	Nordin, Norman, Embi, Mansor, & Idris (2016);
Mat-jizat, Samsudin, & Yahaya (2014); Zulkafli & Mohamad (2018).	Jamaluddin (2018); Ghazali & Nordin (2016);
	Goh, Wong, & Ayub (2018).

4.2.1 MOOC acceptance: Students’ and instructors’ perceptions toward MOOC

Positive perception towards the technology learning method can influence students’ decisions to continue learning (Barreto, Vasconcelos, and Orey, 2017). Analyses of literature reveals that students and instructors in Malaysia positively accepted MOOC as a means of lifelong learning (Ab Jalil et al., 2016; Albelbisi and Yusop, 2019; Ghazali and Nordin, 2016; Mansor, Latifah, and Amina, 2015; Nordin, Norman, and Embi, 2015).

The wide-ranging materials in MOOC make it a significant tool of resources to which learners can refer in the future (Albelbisi, 2019; Goh, Wong, and Ayub, 2018). MOOC contributes to promoting learners’ expectations as they can choose certain topics that they desire to learn, which makes their learning more personalized and enhances the student-centered approach. It also helps learners to understand the content and apply it in real life situations. In a study by Al-Atabi and DeBoer (2014), the majority of MOOC learners highlighted that MOOC is considered an effective platform of learning as they can receive a high level of peer support and can get feedback on their work. In general, learner satisfaction regarding the quality of the MOOC materials was significant. Thus, MOOC has the ability to transform the traditional classroom and promote educational development (Ghazali, and Nordin, 2016).

Fadzil et al. (2015) report that MOOC brings positive impact to the education system in Malaysia. MOOC promotes educational institution branding, improves institutional collaboration, and enables critical transformation in traditional learning methods by attracting large numbers of learners and providing them with high quality learning.

4.2.2 MOOC delivery

The results of analysis of MOOC studies indicate significant aspects of MOOC delivery. Badusah et al. (2016) point out that MOOC learners prefer the unstructured learning tasks and show that learning via groups where the learners can collaborate with one another is better than that of individual learning. The study also notes that the integration of live action videos, animations, and funny elements (such as speech balloons) increase learners’ attention in MOOC video lectures.

Regarding factors for developing MOOC learning content, Nordin et al.(2016) highlight that the type of MOOC and types of video lectures (i.e., animated videos and live action videos) are significant factors. The importance of types of MOOC (i.e., xMOOCs and cMOOCs) in the development of MOOC content is related to diverse pedagogical backgrounds and a different set of skills and abilities behind each type of MOOC.

Most MOOC learners perceive positive attitudes towards MOOC as they have indicated that learning via MOOC makes learning more interesting and easier for them (Jamaluddin, 2018; Nordin, Embi, and Norman, 2016). With

regard to anxiety, one third of learners feel anxious about using MOOC for learning; this anxiousness might happen because many are novices in using MOOC.

Nordin, Norman, and Embi (2015) show that the UTAUT factors (performance expectancy, effort expectancy, social influence, and facilitating conditions) positively influence learner intention towards using MOOC. The positive results achieved for the UTAUT factors indicate that learners accept the use of MOOC as a learning platform.

4.3 Issues of MOOC Implementation

MOOC remains a future concern (Baker et al., 2015) and supporting MOOC in term of guidelines, facilities, and training is vital particularly by policy makers. Policies for implementing MOOC that address MOOC stakeholders' challenges have been found to be the essential area for development in Malaysian higher education context (Kumar and Al-Samarraie, 2018). Thus, to insure implementation of e-learning systems -such as MOOC- successful policies relating to infrastructure, instructor's professional development, curriculum integration, and students learning outcomes (Kong et al., 2014), are some of the crucial areas that should be highlighted.

The analysis of the MOOC research shows that despite the many positive aspects of MOOC in Malaysia, several issues regarding its implementation need further attention. First, one of the key issues is that the Malaysia MOOC courses have yet to demonstrate the massive potential of MOOC. Mansor et al.(2014) indicated that courses from the OUM have attracted only several hundred views on iTunes U per course. In comparison, prominent North American platforms demonstrate high enrollment numbers which indicate the true massiveness of MOOCs. For instance, the first MOOC course offered by Udacity in 2011 named Introduction to Artificial Intelligence successfully registered more than 160,000 people from 190 countries (Udacity, n.d.).

Second, while all the universities in Malaysia that offer MOOC courses are now open to anyone who wants to enroll, the majority of registered students are Malaysians. This is because current MOOC courses are designed as complementary resources for existing on-campus courses, thus relevant to and of interest to Malaysian students. This indicates that the courses are targeted at a narrow group of potential learners, not all people, neither in Malaysia, nor other countries (Mansor et al., 2015). In contrast, MOOC platforms overseas attract those outside formal undergraduate studies such as working adults, professionals, and even housewives. For example, Kolowich (2012) found that 41% out of more than 14,000 registrants who were surveyed from Coursera's opening course, Introduction to Machine Learning, recognized themselves as professionals, holding technology industry jobs.

Third, lecturers' self-efficacy is a key challenge facing MOOC as noted by Ghazali and Nordin (2016). Self-efficacy refers to the individuals' belief in, or awareness of, their capability to organize, manage, and implement, actions to complete a task at a certain level of performance (Sharp et al., 2013). A low self-efficacy level in the context of MOOC is understandable due to lecturers' unfamiliarity with the tools or platforms. However, it needs to be managed well to avoid their reluctance to use MOOC in future.

Fourth, limited Internet access has likely become a significant cyberinfrastructure obstacle for potential registrants to learn via MOOC if not managed well. In a study involving 4,449 students, the findings indicate that more than 70% of students still rely on university-provided Wi-Fi compared to a few of them who use their personal Internet broadband (Ab Jalil et al., 2016). This data shows that students will need reliable and affordable cyberstructure support in accessing and completing MOOC courses, especially because most of the content is video delivered.

Fifth, a study by Nordin et al. (2016) reveals that one third of Malaysian students enrolled in MOOC courses express anxiety in using MOOC in learning. Although this is quite common in students new to MOOC, especially in handling the massive MOOC resources (Kop, 2011), it would help to explore various approaches for reducing anxiety in using MOOC. The next section of this paper will outline several recommendations to overcome these challenges.

5. Conclusion and recommendations

This systematic literature review research aims at contributing to current MOOC literature by investigating the evolution and challenges experienced in a top-down nationwide MOOC initiative in Malaysia, specifically in the

higher education context. The 25 studies reviewed indicate that MOOC has become a new trend in the Malaysian education system and government efforts to institutionalize it have widened students' and instructors' perspectives on transforming current ways of teaching and learning. The findings document positive acceptance of MOOC. It is seen as an excellent tool to help promote lifelong learning. The content of its platform and delivery methods are well designed to support meaningful learning. However, the four main issues highlighted in the literature also deserve attention. The following recommendations may be useful in furthering MOOC expansion in Malaysia and other countries sharing similar interest to institutionalize their MOOCs.

First, actively promote MOOC as a new way of learning by developing more courses that are on-demand, non-formal and informal in nature. Examples may include courses preparing students for job searching, preparation courses for industry and professional certifications, courses built in partnership with specific organizations or industries, and courses for subjects of distinctiveness for the country. Perhaps a needs analysis can be performed before developing MOOC. This analysis will help in identifying possible topics of interest and match them with specific target audiences.

Second, provide a standard or guideline for developing quality MOOCs at the national level. This guideline may include topics such as plans for MOOC, producing high-quality videos for MOOCs, and optimizing existing features in the MOOC platform.

Third, more training programs should be conducted for academic and supporting staff on planning, designing, developing, and delivering, MOOC to students from various educational backgrounds (Ghaffar et al., 2016). The training should focus on effective pedagogical models (Ayub and Leong, 2017) to teach in the MOOC environment rather than merely on technical aspects such as video production, as well as focusing on improving lecturers' self-efficacy (Ahmad et al., 2017). The combination of all three aspects – technical, pedagogical, and soft skills – in training will help lecturers design and implement more effective and meaningful MOOC-based learning for students.

Finally, established and reliable infrastructure and info-structure for MOOC delivery, including stable Internet connection, wide Internet coverage at an affordable cost, and quality content, in order to promote accessible learning among the public. These recommendations will help the process of MOOC enculturation in any nation in the long run.

The nationwide MOOC initiatives are applaudable; thus, it is clear that investigating this initiative in-depth and addressing the issues affecting implementation of the MOOC initiative is an important area of study that contributes to understanding the successful implementation of nationwide MOOC initiatives in the Malaysian higher education system. We hope future works may examine the human factors (i.e., students' satisfaction) and learning theories that will truly make nationwide MOOC initiatives in Malaysia more effective.

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