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The MOOC dropout phenomenon and retention strategies

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ABSTRACT

The high dropout rate from Massive Open Online Courses (MOOCs) has been a major concern of researchers and educators over the years. Although academic papers on MOOCs have mushroomed over the past ten years, few studies have focused on MOOC dropout and retention. In particular, research on hospitality and tourism MOOCs has remained nascent despite the field's significant contribution to international business and global employment. Because of the lack of relevant literature on hospitality and tourism MOOCs, this study conducts a systematic review of the MOOC literature on the broader education field, examining the MOOC dropout phenomenon and retention strategies. The results of a content analysis based on journal articles' main research topic show four clusters: prediction, continuance intention, motivation, and attrition. Thematic analysis is used to categorize the dropout factors into seven major themes: learning experience, interactivity, course design, technology, language, time, and situation. This paper concludes with a summary of the results, recommendations, practical implications, limitations, and directions for future research.

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1. Introduction

Over the years, the use of technology to transform education and improve student learning has increased in popularity among educators, researchers, and learners (Hew & Cheung, 2014). The development of the Internet and other technological innovations has facilitated the evolution of the education model from traditional classroom face-to-face learning to online distance learning. In the past 10 years, online learning has further developed into Massive Open Online Courses (MOOCs), which have made education easily accessible to a massive number of people all over the world and increased educational institutions' reach (Hew & Cheung, 2014).

The importance of MOOCs as a means to enhance the quality of higher education and boost universities' competitiveness has been emphasized (Hone & El Said, 2016; Jo, 2018). Furthermore, it is believed that the emergence of new educational formats such as MOOCs will fundamentally affect the higher education sector as well as other industries (Kaplan & Haenlein, 2016). For instance, many top-tier universities have developed MOOCs that have been integrated into in-house training programs for executives and

employees in the corporate world. Currently, MOOCs are short specialized courses offered free of charge or for a small fee that provide a completion certificate. The flexibility and cost effectiveness of MOOCs is likely to attract corporations to prefer digital training modules over traditional ones (Kaplan & Haenlein, 2016). In addition, it is predicted that more universities will take the major step of offering undergraduate degrees online, either partially or entirely (QS, 2016). MOOCs may offer a feasible solution for the growing demand for higher education in Asia and Africa. There is silent agreement that higher education is going digital and that MOOCs can be the catalyst for the development of programs that respond to the changing world (Palmer, 2014). One major benefit of MOOCs for universities is that they provide instant data on students' online engagement, enabling developers to continuously improve their courses (QS, 2016). Moreover, the rich data available from MOOC digital platforms, which provide a wealth of useful information, can greatly benefit research on online learning (Diver & Martinez, 2015).

MOOCs first appeared in 2008 and have continuously gained in popularity. Stanford University launched its MOOCs in 2011, and Harvard University partnered with the Massachusetts Institute of Technology (MIT) to launch the EdX platform in 2012. Since then, the numbers of courses offered and learners who have signed up for MOOCs have skyrocketed. In 2015, Class Central (Shah, 2015) reported a total of 4,200 MOOC courses launched by over 500 universities. By the end of 2018, over 900 universities around the world had launched a total of 11,400 MOOCs with over 100 million learners (Shah, 2018). Amidst the growing number of courses offered through MOOCs, it is important to note that tourism and hospitality MOOCs are scarce and underdeveloped compared to other disciplines (Lin et al., 2018). By 2015, only 51 tourism and hospitality MOOCs existed, with 23 provided by higher education institutions. The first tourism and hospitality MOOC was *Tourism Industry Analysis*, offered on the Canvas Network platform by Central Florida University in 2013, followed by *Introduction to Wines 101* by Taylor's University in Malaysia in 2014 (Lin & Cantoni, 2018).

With the popularity of MOOCs continuously growing, research into the MOOC phenomenon has mushroomed (Lin & Cantoni, 2018). Academic papers on MOOCs first appeared in the peer-reviewed literature in 2008 and have continuously increased in number since then (Liyanagunawardena et al., 2013). Systematic reviews of the literature have revealed 362 empirical papers, with 25 papers focusing on motivations and challenges of MOOCs (Hew & Cheung, 2014), 146 papers exploring MOOC research paradigms (Zhu et al., 2018), and 102 empirical studies on learning and teaching in MOOCs (Deng et al., 2019). It is important to note that the paucity of available tourism and hospitality MOOCs has yielded fewer studies in the field. By May 2017, only 18 relevant publications were available through a Google Scholar search: 8 journal articles, 8 conference proceedings, and 2 book chapters (Lin & Cantoni, 2018). In November 2019, the lead author of this paper conducted a Google Scholar search using the keywords "tourism" and "MOOC." The results revealed 19 articles, with only 10 directly related to hospitality and tourism MOOCs. This lack of research sounds a call to tourism and hospitality scholars and educators to focus on the growing demand for MOOCs.

Although academic papers on MOOCs have mushroomed in the past 10 years, few scholars have focused on dropout and retention. However, the dropout phenomenon has always been a concern for most MOOC providers. Despite high enrollment rates, MOOCs face the problem of dropout rates as high as 90% (Eriksson et al., 2017; Hew & Cheung,

2014; Jordan, 2014; Yang et al., 2017). By 2012, scholars were mainly concerned with general challenges, trends, motivations, student assessment, and the quality of MOOC education (Hew & Cheung, 2014; Liyanagunawardena et al., 2013). In 2016, only 11 of 146 empirical studies investigated dropout and retention in MOOCs (Zhu et al., 2018). In contrast, during the era of online education from 1999 to 2009, before the advent of MOOCs, 35 empirical studies focused on students' dropout from post-secondary online courses (Lee & Choi, 2011).

Because of this paucity of research on the MOOC dropout phenomenon (Alraimi et al., 2015), this study conducts a systematic review of the literature. To the best knowledge of the authors of this paper, no study has synthesized research on MOOC dropout for the period 2008 to 2018. Tourism and hospitality education can benefit from MOOCs, yet research in this field has remained nascent (Lin & Cantoni, 2018; Lin et al., 2018; Ryan et al., 2016). This study examines the factors influencing the MOOC dropout phenomenon and recommended retention strategies in the broader education literature. This study further investigates the MOOC dropout model and compares the traditional classroom and distance online environments. Understanding the MOOC dropout phenomenon and increasing knowledge of the factors affecting retention will enable MOOC providers to enhance MOOC design features and improve course quality. By drawing from research in various fields, tourism and hospitality scholars can build on existing work and avoid reinventing the wheel. Although research on MOOCs spans numerous disciplines, some aspects may be specific to hospitality and tourism.

2. Literature review

2.1 Overview of MOOCs

Distance learning, e-learning, and open online courses existed before the 21st century. However, it was not until 2008 that the term “Massive Open Online Course” (MOOC) emerged (Fini, 2009). The term was coined by George Siemens and Stephen Downes when they administered an open online course on Connectivism and Connective Knowledge (CCK08) through the University of Manitoba in 2008 (Fini, 2009). Participants registered for the course either formally, to earn credits from the University of Manitoba, or informally, taking the course at their own pace without receiving any academic credits. The informal CCK08 open online course became “massive” when over 2,000 people around the world signed up, each with different behaviors, outcomes, and levels of involvement. Hence, CCK08 is considered the first MOOC (Liyanagunawardena et al., 2013).

MOOCs allow learners to participate in open, public online communities with no class size limitations, prerequisite knowledge, or strict registration criteria, and usually free of charge except when a completion certificate will be awarded (Hew & Cheung, 2014; Jo, 2018). A typical MOOC consists of a series of video lectures, discussion forums, assignments, quizzes, and exams. No standard definition of MOOC exists in the literature beyond the acronym: a MOOC is *Massive* because thousands of learners can take the same course at the same time; it is *Open* to anyone to enroll, regardless of academic achievement, and available to everyone at no fee or at a low cost; learners access the course *Online* and can

interact with other learners around the world; and the *Course* is designed for effective online learning.

Scholars have classified MOOCs into two major types based on different learning theories: the connectivist “cMOOC” and the extended “xMOOC” (Murphy et al., 2017; Ryan et al., 2016). The cMOOC follows connectivism learning theory, where learners seek and share information through networks of distributed online resources. The actual course materials and course content are defined by the learners as the course progresses. It has no formal curriculum and features unstructured sessions based on continuous learning (Hew & Cheung, 2014; Lin et al., 2018; Zhu et al., 2018). The xMOOC follows a more traditional cognitivist-behaviorist learning approach. All course content and course materials are predetermined by the instructor through structured learning pathways centralized on a digital platform such as Coursera or edX (Zhu et al., 2018). It follows a formal curriculum and uses a lecture style through interactive media to emphasize individual learning rather than learning from peers. It typically consists of video lectures, discussion forums, readings, quizzes, assignments, and exams. Scholars have viewed cMOOC as knowledge creation and instructors as content facilitators, and viewed xMOOC as knowledge duplication and instructors as content generators (Murphy et al., 2017).

The differing cMOOC and xMOOC pedagogies require separate digital platforms, and xMOOCs are most popular because of their affiliation with popular MOOC providers and major platforms (Murphy et al., 2014). MOOC providers are universities or academic institutions that are responsible for the content and quality of the courses. These institutions partner with MOOC digital platforms for technical production and facilitation. The rise of MOOC platforms in 2012 shifted the pedagogy of connectivism to cognitivism and behaviorism, which popularized the xMOOC format (Lin et al., 2018). As of 2018, the top five MOOC platforms were Coursera, edX, XuetangX, Udacity, and FutureLearn (Shah, 2018).

2.2 MOOC dropout and retention issues

Several issues faced by MOOCs have come to the fore, notably the high dropout and low retention rates. High dropout rates have been regarded as one of the greatest challenges faced by online educators and administrators since long before the era of MOOCs (Lee & Choi, 2011). However, the problems faced by online educators and students in e-learning courses differ from those related to MOOCs. For instance, with traditional online learning, failure to complete an online course may lower a student’s self-confidence or self-esteem and discourage them from registering for other online courses (Lee & Choi, 2011). For institutions, high dropout rates imply ineffective online programs and a consequent loss of profit. These problems point to the fact that administrators of online courses have struggled to improve completion rates and have sought to identify the reasons why students drop out to minimize attrition (Lee & Choi, 2011).

Research has shown that completion is not the goal of many students who sign up for MOOCs. Various intentions and motivations exist beyond completing a course or earning a certificate (Breslow et al., 2013; Hew & Cheung, 2014; Wang & Baker, 2018). For instance, Hew and Cheung (2014) identified numerous reasons why students sign up for MOOCs, including the desire to learn new topics or extend current knowledge, simple curiosity, to

face a personal challenge, or to collect many completion certificates. A review of the first MOOC, CCK08, revealed that many learners were less concerned with completing the course and preferred passive, time-saving mailing lists over interactive and time-consuming discussion forums (Fini, 2009). It is worthwhile to note that the attitudes of MOOC learners have changed over time, as have the factors affecting student attrition. This study examines these factors to aid in understanding the MOOC dropout phenomenon and suggest mitigating interventions where appropriate.

However, student attrition is a complex phenomenon because it involves human behavior and the behavioral, affective, and cognitive engagement of learners (Hew, 2016; Lee & Choi, 2011). Moreover, the lack of scholarly agreement on the definitions of dropout, attrition, and completion exacerbates the complexity of the MOOC dropout phenomenon. In MOOCs, attrition happens over time: a large proportion of students drop out after the first week, and a significant proportion remains longer but drops out eventually (Greene et al., 2015). Every MOOC follows the same pattern of an initially large enrollment number, with only a small proportion of students completing the course. In addition, MOOC learners who drop out of a course are unlikely to answer post-course surveys, so it is difficult to know their reasons for dropping out (Eriksson et al., 2017).

The model for determining dropouts in MOOCs differs from the traditional face-to-face classroom learning and distance online learning environments. Tinto (1975, as cited in Lee & Choi, 2011) developed a student integration model in the traditional classroom face-to-face setting. Tinto suggested that a student's dropout decision depends on the level of social and intellectual integration. He posited that dropout is more likely to occur if the student is unable to integrate into the social community or conform to the intellectual norms of the college. Based on Tinto's model, Kember (1995, as cited in Lee & Choi, 2011) developed a model of dropouts in distance education, which provided the framework for online education. Kember proposed two paths for learners: one from social to academic integration, and the other from external attribution to academic incompatibility. The learner selects one of the two paths and makes the decision to drop out or continue based on the balance between GPA and the cost of learning. Kember's model included negative social integration components such as insufficient time, unexpected events, and distractions. Kember applied his model to distance education students who are normally part-time or who have full-time jobs and thus face the challenge of integrating study demands with work, home, and friends. In both Tinto's and Kember's models, dropout is caused by the student's failure to integrate into the social life of the institution and incompatibility with academic demands (Lee & Choi, 2011).

3. Method

In this study, the authors first conducted a rigorous systematic narrative review of journal articles following the guideline of Creswell (1994, as cited in Hew & Cheung, 2014), who stated that a systematic review gives a summary of the current state of research on a certain topic of interest. The focus of this study is the dropout phenomenon in MOOCs. The authors adapted the research process of other scholars by studying the topics in phases and stages from April to November 2019 (Deng et al., 2019; Lin et al., 2018; Zhu et al., 2018). The review consisted of three phases: Phase 1 consisted of the article search and filtering process, Phase 2 was the iterative screening, and Phase 3 was the content

analysis of all selected articles, categorizing them into topical themes and synthesizing the dropout and retention factors. The authors began the narrative review process by defining the topic, choosing the databases, and deciding on the selection criteria, such as keywords and period of publication.

The authors decided on seven selection criteria modified and adapted from Zhu et al. (2018). First, the keywords “MOOCs,” “dropout,” and “retention” or “completion” had to be present in the abstract and content. Second, four databases were searched for journal articles – Scopus, Web of Science, EbscoHost, and ScienceDirect – and a snowball search was conducted on Google Scholar. Third, the publication period was between 2008 and 2018, which is considered the period of evolution of MOOCs. Fourth, only empirical studies were considered; non-empirical studies such as literature reviews, concept notes, reports, and book chapters were excluded. Fifth, only peer-reviewed journal articles were selected; conference proceedings and unpublished theses were excluded. Sixth, studies had to primarily investigate the MOOC dropout phenomenon, and those that did not directly address dropout factors or retention strategies were excluded. Finally, only papers published in English were selected.

3.1 Data collection

Phase 1 consisted of a three-stage search process adapted from Deng et al. (2019). The first stage included an initial search applying the seven selection criteria, which yielded 34 papers. In the second stage, the snowball method was used to improve the coverage of the relevant literature from the reference lists of the identified papers, yielding 25 more papers. Thus, a total of 59 papers were retrieved in the two stages. The last stage involved cross-checking for duplicates and reading the abstracts to determine whether each paper met the criteria. If the abstract was not conclusive, the full paper was read to make a final decision. Three duplicates from two databases were found, and 28 of the 59 papers did not meet the selection criteria. Accordingly, a total of 28 papers were selected for review. However, during the iterative screening of the selected papers to increase validity, six papers were found not to meet one of the seven criteria. Thus, a total of 22 papers were subjected to critical analysis. Although substantial effort was made to include as many relevant papers as possible, the result may not be exhaustive. Nonetheless, further searches reached the saturation point, so the researchers ended the snowball process.

3.2 Data analysis

Phase 3 consisted of classifying the selected papers using open-coded content analysis (Liyanagunawardena et al., 2013). Each paper was treated as a basic unit of analysis, using a constant comparative method (Hew & Cheung, 2014). Each paper was read and the contents noted to identify a theme. Each paper was compared with those previously read, and if the contents were similar, then both were put into the same theme; otherwise, another theme was created. This process was repeated until all of the papers were classified. Thematic analysis was conducted twice: the first time to classify the main purpose of study and the second to classify the dropout factors. Quantitative analysis was also conducted to classify the papers according to publication year and type, country of research, and journal of publication. A summary table was produced for each category

to facilitate the identification of similarities and differences between the publications in the sample. A subsequent iterative process of rereading was conducted across all selected papers to identify the themes and patterns of MOOC dropout factors. This process was necessary to ensure that all of the key information in each paper was identified and analyzed.

4. Findings and discussion

The findings of the systematic literature review are presented in this section using figures and tables to ensure conciseness and easy reference, with corresponding explanations and discussions. Quantitative data are presented, followed by a thematic categorization of the main focus of study for each paper. Lastly, thematic analysis is conducted of the factors influencing MOOC dropout, with detailed reasons and corresponding recommendations from various authors.

4.1. Quantitative details

To explore and establish the historical information of the publications, reviewed papers were identified by the year of publication, the publishing journal, and the country where the research was conducted. As discussed, the first MOOC-related paper was published in 2008 with the birth of MOOCs. The number of publications steadily increased with the boom of MOOCs in 2012, dubbed “The Year of MOOCs” by the *New York Times* (Kaplan & Haenlein, 2016). During that period, enormous research attention was focused on MOOCs education due to the thousands of MOOCs offered by universities globally (Zhu et al., 2018). However, no dropout-related papers were published until 2015, when six articles appeared in peer-reviewed journals. Therefore, Figure 1 only reflects the number of journal publications per year from 2015 to 2018.

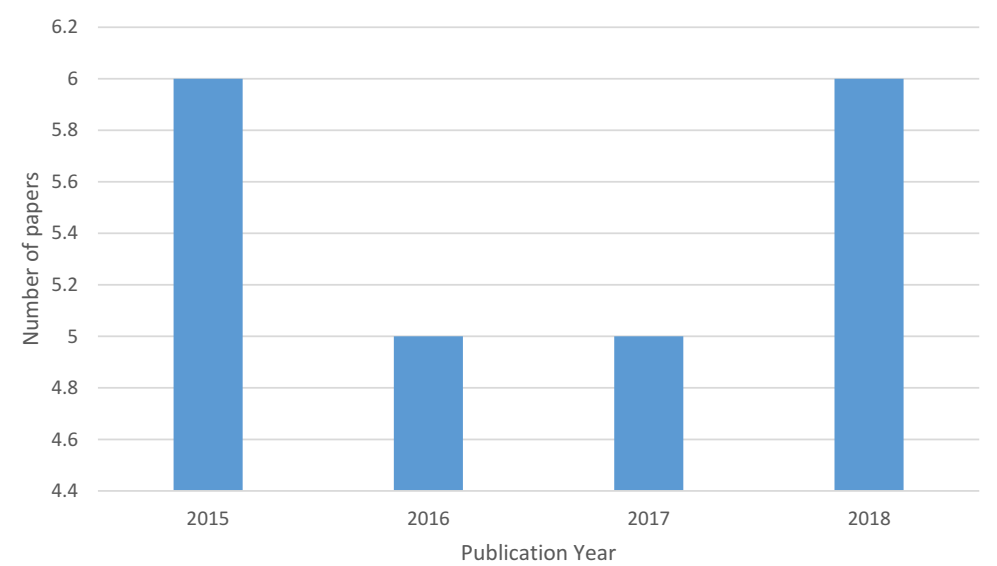


Figure 1. Number of MOOC dropout-related journal articles per year (n = 22).

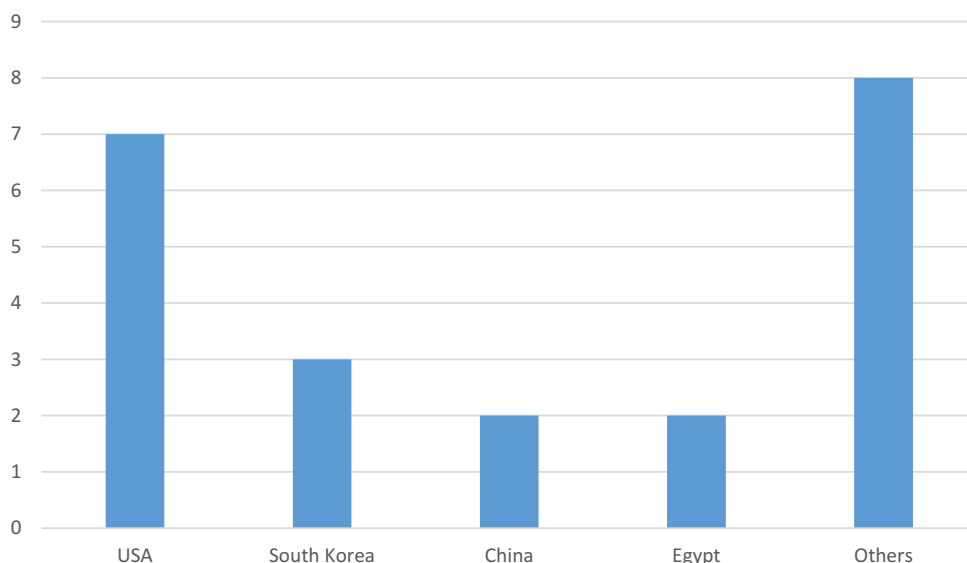


Figure 2. Countries of research site from 2015 to 2018.

Figure 2 shows the country of MOOC origin, the research site, and the location of the first author, where applicable. The countries with the most substantial MOOC dropout-related research were the USA ($n = 7$), followed by South Korea ($n = 3$), then China and Egypt ($n = 2$). Eight other countries ($n = 1$) lumped together as “Others” include Australia, Malaysia, Mexico, the Netherlands, Russia, Spain, Sweden, and Taiwan. The USA had by far the most studies. This finding is consistent with the results of previous authors who conducted systematic reviews of MOOC papers from 2014 to 2016 (Deng et al., 2019; Zhu et al., 2018). It is not surprising that the USA has the most MOOC research given that its major universities pioneered the proliferation of MOOCs through the US-based digital platforms Coursera and edX, and myriad courses are offered by US universities. Geographic distribution by region revealed that North America has the highest number of papers ($n = 8$), followed by Asia ($n = 7$) and Europe ($n = 4$). It is interesting to note that Asia has the same number of papers as the USA, which is in contrast to the results of previous studies (Deng et al., 2019; Liyanagunawardena et al., 2013; Zhu et al., 2018). This finding alludes to the growing interest of Asian scholars in MOOC research, and their particular focus on the dropout phenomenon. This trend is likely to grow with the rise of China’s first and biggest MOOC platform, XuetangX (D. Shah, 2016).

The 22 papers were published across 17 journals, 13 of which were education journals and 4 technology-related journals. *Computers and Education* had the highest number of papers ($n = 5$), followed by *Distance Education* ($n = 2$). This is not surprising, as the two journals primarily publish research related to distance education, online learning, and MOOCs. It is interesting to note that the *International Review of Research in Open and Distance Learning* (IRRODL) had several MOOC publications reported by Zhu et al. (2018). However, this study only returned one published paper on MOOC dropout. This further confirms the limited research on MOOC dropout. No hospitality and tourism education

journals were included in the list, further confirmation of the lack of research focus on MOOCs in hospitality and tourism education.

4.2. Thematic clusters of research papers on MOOC dropout

Content analysis was conducted on the 22 papers to classify the main purpose of research. Four thematic clusters were identified: *Prediction*, *Continuance Intention*, *Motivation*, and *Attrition* (see Table 1). Notably, each paper investigated the MOOC dropout phenomenon from different perspectives.

The five papers in the *Prediction* cluster primarily investigated the predictors of dropout or retention using machine learning systems and data analytics, resulting in different sets of predictors. Greene et al. (2015) identified students' level of commitment, intention to obtain a certificate, and prior experience with MOOC as predictors of retention. Level of schooling is a predictor of achievement, and time devoted to MOOCs is a predictor of both retention and achievement. Vu et al. (2015) focused on social learning factors such as user active time and performance indicators, as well as clickstream and forum behavior, as predictors of dropout events. Their findings revealed that learners visiting the course from the start date and those with high quiz scores are less likely to drop out. Regarding clickstream behavior, learners who spend more time watching video lectures and viewing wiki or forum pages are less likely to drop out. Learners who actively contribute to forum discussions are also less likely to drop out. Other researchers primarily focused on the application of their proposed models to predicting dropout behavior (Allione & Stein, 2016; Mohamad et al., 2018; Xing et al., 2016). Some authors advocated the use of dropout prediction models to identify crucial dropout factors that can facilitate the design of interventions to enhance learners' engagement and consequently increase MOOC completion rates (Mohamad et al., 2018; Xing et al., 2016).

Six papers investigated the *Continuance Intention* of MOOC learners, using the Technology Acceptance Model (TAM) or the Information Systems (IS) continuance model. Most of the findings revealed that perceived ease of use and perceived usefulness, mediated by user satisfaction, have positive effects on the continuance intention of MOOC learners (Alraimi et al., 2015; Jo, 2018; Joo et al., 2018; Yang et al., 2017). Some authors revealed unique factors that influence continuance intention, such as metacognition (Tsai et al., 2018), knowledge outcomes, performance proficiency (Zhou, 2017), and the perceived reputation and openness of MOOCs (Alraimi et al., 2015). According to Zhou (2017), learners who perceive that MOOCs can improve their knowledge scope and performance are more likely to continue learning with them.

The three papers under the *Motivation* cluster investigated the motivations for enrolling in a MOOC. The lack of motivation may be the primary reason why students drop out of MOOCs that they are not required to complete (Xiong et al., 2015). Researchers have identified various factors that influence students' motivation to enroll in and complete MOOCs, and have compared completers and non-completers. For instance, Wang and Baker (2015) reported that completers are more interested in course content, whereas non-completers are only interested in the learning experience. Xiong et al. (2015) posited that both intrinsic and extrinsic motivations predict student retention, whereas Wang and Baker (2018) found that grit and goal orientation are associated with course completion.

Table 1. Thematic clusters of research papers on MOOCs dropout (n = 22).

Themes	Focus of study	Findings of the study	Authors
Prediction	Retention and achievement (survival analysis)	Predictors of retention: level of commitment, time devoted to MOOCs, prior experience with MOOC and intention to obtain a certificate. Predictors of achievement: level of schooling and time devoted to MOOCs	Greene et al. (2015)
	Students at-risk (temporal modelling)	Early and accurate identification of students at-risk of dropping out.	Xing et al. (2016)
	Retention rate (predictive analytics)	Application of predictive analytics and implement intervention programs to mitigate the low retention rate and improve the MOOC learning environment.	Mohamad et al. (2018)
	Dropout events (relational event model)	Predictors of dropout events: user active time, quiz performance, user pass achievement, clickstream behavior, and user forum behavior	Vu et al. (2015)
	Demographics (Cox proportional hazard model)	Younger participants, undergraduate students, and females are more likely to drop out.	Allione and Stein (2016)
Continuance intention	Technology acceptance model (TAM)	Perceived ease of use and perceived usefulness, mediated by satisfaction, have indirect effects on continuance intention.	Joo et al. (2018)
	Information system (IS) continuance model and task-technology fit	Task-technology fit, perceived usefulness, and user satisfaction have positive effects on continuance intention.	Jo (2018)
	Metacognition and learning interest model	Metacognition and 3 levels of learning interest (liking, enjoyment, and engagement) are positively related to continuance intention to use MOOCs.	Tsai et al. (2018)
	Expectation confirmation model	Knowledge outcome, social influence, satisfaction with a prior learning experience, and performance proficiency, are indicators of continuance intention of MOOCs.	Zhou (2017)
	IS continuance model	Perceived reputation, perceived openness, perceived usefulness, perceived enjoyment, and user satisfaction have significant influence on continuance intention.	Alraimi et al. (2015)
	IS success model and TAM	System quality, course quality, service quality, perceived usefulness, and perceived ease of use, are significant antecedents of continuance intention.	Yang et al. (2017)
Motivation	Course completion, mastery goals, and self-efficacy	Completers more interested in course content, tend to have more self-efficacy; non-completers interested in the learning experience.	Wang and Baker (2015)
	Intention, goals, and completion	Grit and goal orientation are associated with course completion.	Wang and Baker (2018)
	Student motivation, engagement, and retention	Intrinsic and extrinsic motivations are significantly predictive of student course engagement, which predicts student retention.	Xiong et al. (2015)

(Continued)

Table 1. (Continued).

Themes	Focus of study	Findings of the study	Authors
Attrition	Forum participation and achievement	Forum participation is positively correlated with achievement, the lower dropout rate for students who participate in the forum.	Diver and Martinez (2015)
	Learner support strategies and retention	Learner support influences student retention: student-content, student-student, and student-teacher interactions, specifically, teacher's presence and maintaining student engagement.	Gregori et al. (2018)
	Retention	Factors affecting retention: Interactivity (course, instructor, learner); technology employment (multimedia or video use, integrative design, learner control); course design (content and structure); perceived value (mobility, rapidity, diversity or novelty, timing, and language).	El Said (2017)
	Terminal efficiency rates	Reasons for dropout: problems with course structure; limitations in the use of ICT; limited English proficiency; family reasons; low time disposition.	Gomez-Zermeno and Aleman de La Garza (2016)
	Barriers to completion	A strong correlation between completion and educational experience – basic subject knowledge, level of education, and previous experience with MOOCs.	Semenova and Rudakova (2016)
	Factors affecting retention	Significant predictor of MOOC retention: course content, perceived effectiveness, and interaction with the instructor.	Hone and El Said (2016)
	Factors influencing dropout	Course content, course design, social situation and characteristics, and ability to manage time.	Eriksson et al. (2017)
	Dropout view	Alternative typology of success and dropout	Henderikx et al. (2017)

The cluster on *Attrition* includes eight papers specifically examining the MOOCs dropout or retention factors. The majority of the authors were in agreement with a number of dropout factors, which are expounded in the next section. Nonetheless, it is worth noting the ongoing scholarly debate on the definition of “dropout” in the MOOC context. The term “dropout” is commonly understood to refer to those who fail to complete a course, which implies that dropping out equals not receiving a certificate (Henderikx et al., 2017). “Learner retention” and “completion rate” are commonly understood to mean the percentage of those who complete a MOOC of those who initially enrolled (El Said, 2017). This is calculated as the number of participants who earn a certificate over the total number who registered (Henderikx et al., 2017). However, the traditional definition of “dropout” in higher education may not be applicable in the MOOC context (Henderikx et al., 2017). Over and above the consideration of dropout as academic failure or voluntary withdrawal, in MOOCs, the learner’s intention is of utmost importance. Thus, using the traditional definition of completion rate results in very high MOOC dropout rates.

Henderikx et al. (2017) presented an alternative typology for measuring success and dropouts in MOOCs based on individual MOOC-takers’ initial intentions and subsequent behavior. They proposed that only those who quit during the runtime or who complete less than they initially intended be regarded as dropouts, while those who actually do as they intend or do more are considered successful. This method resulted in a lower dropout rate than by the traditional calculation. In the review of the first MOOC, Fini (2009) affirmed that the terms “attrition” and “dropout” may not be appropriate for MOOCs because many students take courses for personal reasons, not expecting

a certificate, and may only be interested in some sections of the course. Hew and Cheung (2014) affirmed that many learners take MOOCs out of curiosity, to face a personal challenge, or to extend knowledge for career advancement without seeking a certificate, whereas others desire to collect completion certificates. Therefore, participants who do not complete a course are not necessarily considered dropouts because of their different aims and motivations. In addition, some scholars have questioned the validity of the dropout or retention rate as a metric for measuring student engagement because many students stay engaged with video lectures and discussion forums without any intention to complete or earn a course certificate (Wang & Baker, 2015).

4.3. MOOC dropout factors and recommendations

Scholars have investigated dropout using terms such as attrition, completion, retention, and continuance. The pattern consistent across different MOOCs on different platforms is a steep drop-off of enrollees during the first few weeks, flattening to an almost negligible rate by the last week (Deng et al., 2019). Scholars have presented key reasons for attrition and the various factors affecting dropout, albeit in different ways and with varying degrees of emphasis.

In this work, using thematic analysis, recurring and similar dropout factors were grouped into themes. Factors with conflicting results, such as the demographic characteristics of learners, were excluded. Seven themes emerged: *Learning Experience*, *Interactivity*, *Course design*, *Technology*, *Language*, *Time*, and *Situation*, as presented in Table 2 with corresponding recommendations from various authors. It is important to note that some of the reasons why students drop out are beyond the capability of the MOOC provider to identify.

Factors grouped under *Learning Experience* refer to the perceptions and experience of the learners enrolled in a MOOC that have direct relationships with dropout, retention, or continuance intention. Studies have shown that students with prior learning experience in MOOCs are more likely to continue with the course (Greene et al., 2015; Zhou, 2017; Semenova & Rudakova, 2016). It has also been found that students with basic subject knowledge and higher levels of education have a higher likelihood of completing an online course (Greene et al., 2015; Semenova & Rudakova, 2016). Studies have also shown that increasing the learner's interest will increase their intention to learn via MOOCs (Tsai et al., 2018). This supports the idea that the completion or dropout rate should not be used as an indicator of learner success because students may define success as the ability to enjoy the MOOC environment (Tsai et al., 2018). Furthermore, learners perceive that MOOCs can extend their knowledge scope; thus, the more knowledge they believe they can obtain from MOOCs, the more likely they are to continue to participate in MOOCs in the future (Zhou, 2017). Moreover, the more learners believe they can improve their performance by learning via MOOCs, the higher the likelihood that they will continue to use MOOCs (Zhou, 2017). A number of scholars have agreed that perceived usefulness and perceived ease of use in the MOOC learning environment have positive effects on user satisfaction and, consequently, on continuance intention (Alraimi et al., 2015; Jo, 2018; Joo et al., 2018; Yang et al., 2017). Studies have also revealed that learners with prior MOOC experience and prior knowledge of the subject matter are more likely to complete the course (Greene et al., 2015; Zhou, 2017; Semenova & Rudakova, 2016). Although

Table 2. MOOC dropout factors and recommendations.

Themes	Factors	Recommendations	Source
Learning	experience	Prior learning experience Knowledge outcome Performance proficiency Basic subject knowledge Level of education Learner control Learning interest User satisfaction Perceived ease of use Perceived usefulness	Enhance learner control by designing the courses as independent modules, with flexibility to combine with modules from other courses. Provide self-paced instructions, each student defines own study path.
El Said (2017); Tsai et al. (2018); Greene et al. (2015);	Semenova and Rudakova (2016); Zhou (2017); Wang and Baker (2015); Jo (2018); Joo et al. (2018); Alraimi et al. (2015); Yang et al. (2017)		
Interactivity	Learner support: (interaction with course content, peers, instructor) Engagement Forum participation Interactive activities Sense of community	Create a learning community via social media and peer-based assessment. Improve the telepresence of instructors to engage learners. Provide engaging interactive activities: quizzes, games, discussion forum, video interactions, blogs, message board, chat room, and Dropbox.	El Said (2017); Xiong et al. (2015); Gregori et al. (2018); Diver and Martinez (2015); Hone and El Said (2016)
Course design	Course structure Course content Course duration Course quality System and service quality Duration of video lectures	Deliver contents in small, meaningful chunks for a rapid scan of course content. Visualize abstract concepts, give less theoretical lectures and more on cases, real examples. Include novel topics not covered in other learning and training media, varied assignments. Keep videos short, 6 minutes. Course duration of 6–8 weeks.	El Said (2017); Eriksson et al. (2017); Yang et al. (2017); Wang and Baker (2015); Gregori et al. (2018); Hone and El Said (2016); Gomez-Zermeno and Aleman de La Garza (2016)
Technology	Use of web technology Key innovative features Task-technology fit Mobility Internet access	Integrate other media formats such as hyperlinks, images, diagrams, and animations. Ensure mobile access under different Internet connectivity conditions.	El Said (2017); Gomez-Zermeno and Aleman de La Garza (2016); Jo (2018)
Language	English proficiency Complex sentences, sophisticated terms, unclear accent of instructor	Consider non-native English speakers: use simple and short sentences, clear explanations. Provide captions and video transcripts.	El Said (2017); Eriksson et al. (2017); Gomez-Zermeno and Aleman de La Garza (2016)
Time	Time devoted to MOOCs User active time Ability to manage time Time zone difference	Consider the time zone differences during live discussions to accommodate students across the globe. Suggest to the learners time needed to devote in a MOOC.	Eriksson et al. (2017); El Said (2017); Greene et al. (2015); Vu et al. (2015); Gomez-Zermeno and Aleman de La Garza (2016)

(Continued)

Table 2. (Continued).

Themes	Factors	Recommendations	Source
Situation	Motivation Intention to obtain a certificate Level of commitment Family reasons Social situation and characteristics Social influence	Provide a relevant certificate. Ensure courses are useful and enjoyable, meet or exceed learner expectations. Promote student motivation and monitor student's online activities.	Xiong et al. (2015); Greene et al. (2015); Eriksson et al. (2017); Gomez-Zermeno and Aleman de La Garza (2016); Zhou (2017)

intention to complete is widely used as a predictor of actual completion, this is not always the case with MOOCs (El Said, 2017). One of the novel factors that enhances retention is learner control, which refers to the MOOC learner's ability to design their own learning tracks and define their own study path (El Said, 2017). MOOC providers need to design courses as independent modules and provide self-paced instructions.

Several authors have claimed that *Interactivity* is one of the major factors affecting dropout (El Said, 2017; Xiong et al., 2015). Online learners' lack of interactivity or low engagement often lead to feelings of isolation and a lack of a sense of community (Gregori et al., 2018). MOOC providers need to create a learning community through social media and peer-based assessments to enhance student-student interaction (El Said, 2017). Improving the telepresence of instructors through live discussion forums will enhance student-instructor interaction (Gregori et al., 2018; Hone & El Said, 2016). More importantly, MOOC providers should offer engaging interactive activities such as quizzes, games, discussion forums, video interactions, blogs, chat rooms, message boards, and Dropbox to enhance sharing between students and instructors.

Course design is the most commonly cited factor affecting MOOC dropout. Learners have complained of poor course design, overwhelming course content, high learning workload, poor course structure, long and boring videos, long course duration, and unchallenging activities (Eriksson et al., 2017; Gomez-Zermeno & Aleman de La Garza, 2016; Hone & El Said, 2016; El Said, 2017). Learners prefer to immediately see the value of a course by quickly scanning the course content and topics. Therefore, MOOC designers should present the content in small, meaningful chunks for rapid scanning (El Said, 2017). This will also address the issue of mismatches between learners' expectations and the actual content and enable them to assess the content difficulty (Eriksson et al., 2017). The quality and length of videos are also important determinants of student retention. Scholars have found that video watching in MOOC is correlated to dropout (Qu & Chen, 2015). Moreover, the average attention span of learners in online courses is not more than 15 minutes (Tsai et al., 2018). Therefore, lecture videos should be divided into smaller chunks of 6 to 10 minutes and course duration should be between 6 and 8 weeks. MOOC providers also should include novel topics that are not covered in other learning and training media. It is important to provide visualizations of abstract concepts with diagrams and animations, provide less theoretical lectures and more cases and real examples, and give a variety of assignments (Eriksson et al., 2017; Hone & El Said, 2016; El Said, 2017). Scholars have agreed that the primary reason that students continue learning via

MOOCs is course quality (Zhou, 2017; Yang et al., 2017). MOOCs' reputation is based on the course quality and the course providers, and therefore it is necessary to use well-established universities and instructors (Zhou, 2017).

Technology has been cited by several authors. MOOCs are technology driven, and learners access the course through their Internet connections. Learners have complained of difficulty with Internet access, especially in developing countries where power cuts and low bandwidth are commonplace (Eriksson et al., 2017). With the development of mobile technology, it is important for MOOC providers to ensure that learners can access a MOOC through mobile phones under different Internet connectivity conditions (El Said, 2017). The advancement of web technology allows the integration of other media formats, such as hyperlinks, texts, images, diagrams, and animations.

Language is a problem for non-native English speakers taking MOOCs in English. Some learners have complained that instructors use complex sentences and sophisticated terms, and have unclear accents (Gomez-Zermeno & Aleman de La Garza, 2016). Therefore, instructors should use simple and short sentences, speak at a moderate speed, and clarify with explanations (Eriksson et al., 2017; El Said, 2017). In addition, lecture videos should include subtitles, and transcripts should be provided both in English and in the local language of the target market, such as Chinese.

Time is a constraint for most learners, especially full-time employees who are faced with the challenge of balancing work and study. Spending the intended number of hours spent on MOOCs decreases the likelihood of dropout (Greene et al., 2015). MOOC providers can facilitate this by indicating the number of hours the learner needs to devote to a MOOC per week. In a survey conducted by Fini (2009) on the first MOOC, the main reason for not completing the course was a lack of time, which was reported mainly by informal MOOC-takers and has also been the most commonly quoted reason by distance learners since 1987. Fini (2009) surmised that MOOC learning experiences compete with other personal priorities and commitments. Moreover, learners come from different parts of the world, so time zone differences can be a problem, especially during live discussion forums. MOOC providers need to consider this when scheduling live discussions. It is also important to give learners sufficient time to complete assignments or exams.

Finally, the *Situational* factor refers to various learner circumstances, such as work commitments, a job change, family reasons, or a lack of motivation to obtain a certificate or of a real intention to complete the course. Studies have shown that motivation is significantly related to students' course engagement, which is a strong predictor of retention (Eriksson et al., 2017; Xiong et al., 2015). In addition, learners with higher levels of commitment to obtain a certificate are less likely to drop out of a MOOC (Greene et al., 2015). Therefore, data should be obtained before students start the course to determine their levels of commitment and thus implement interventions to retain them. Moreover, Diver and Martinez (2015) surmised that part of the reason for high dropout rates is the perceived low value of a certificate relative to the work required to obtain it. The solution is to provide a more significant certificate and to ensure that the quality of the course meets or exceeds learners' expectations. It is also believed that for many students, a MOOC is a new experience; hence, they pay close attention to the social influence of the media and the people around them (Zhou, 2017). Therefore, MOOC providers should invest in their marketing campaigns and build their brand image, not only to attract students but also to retain them.

4.4. The dropout model

As demonstrated earlier, the dropout model for traditional face-to-face classroom learning varies with distance online learning environments. However, Lee and Choi (2011) suggested that in both types of learning environments, dropout is caused by “unsuccessful integration into the life of the institution and/or unsatisfactory compatibility to the academic demands” (p. 594). The results of this systematic literature review indicate that these two factors do not hold for MOOCs. Although it is incorrect to consider MOOCs as an entity separate from other types of online distance learning environments, it is also unfair to place upon MOOCs the same expectations for engagement and retention as other educational formats (Diver & Martinez, 2015).

MOOCs face unique challenges that warrant new ways of thinking about learners’ participation and intention or motivation to enroll in a MOOC. First, enrollment in a traditional classroom course or in an e-learning university program requires high qualification criteria to be met because these courses are credit-bearing. In contrast, to enroll in any MOOC, the student only needs to click on a link, and does not need to complete an admission process or pay a tuition fee. Second, a MOOC normally does not require any prerequisite courses; hence, learners from any academic background can take a MOOC. Third, most MOOCs do not bear any credit, and learners may opt to obtain a completion certificate for a minimal fee. Diver and Martinez (2015) suggested that high MOOC dropout rates could be the effect of learners simply trying out the course because there is no cost to sign up and no restrictions. All of these findings point to one of the hallmarks of MOOCs, openness (Eriksson et al., 2017). This openness results in a large number of students registering for a MOOC without intending to complete it, with some dropping out at every point during the course (Xing et al., 2016).

Traditional online courses also face the problem of high dropout rates, which is a major concern for educators for a number of reasons (Lee & Choi, 2011). However, these reasons may not be the same as those for MOOCs educators and providers. Before the advent of MOOCs, several scholars examined the factors affecting dropouts from online education. Lee and Choi (2011) conducted a systematic review of 35 journal articles investigating dropout factors from 1999 to 2009, the period of dramatic growth for online education. They identified nine categories grouped into three main sections. The first was *Student* factors, consisting of four categories: academic background, relevant experience, skills, and psychological attributes. The second was *Course/Program* factors, consisting of three categories: course design, institutional support, and interaction. The third was *Environmental* factors, consisting of work commitments and support environment. In comparison, the authors of the present study conducted a systematic review of 22 journal articles, examining MOOC dropout factors from 2008 to 2018, the period of growth of MOOCs. The authors grouped the factors into seven main themes, as discussed. The dropout factors in traditional online education and MOOCs bear both similarities and differences. The similarities include factors such as time management skills, work commitments, the ability to balance academic and professional work, interaction between students and with the instructor, support from the family, course design and quality, and previous experience with online courses. The major differences include the academic background of the students and institutional support. As mentioned earlier, traditional online courses require certain levels of GPA and previous academic performance.

Students of online education require administrative and infrastructure support as well as orientation and tutorial support, which are not necessary with MOOCs. It is interesting that “computer confidence and relevant prior computer training” were among the factors affecting dropouts in online education (Lee & Choi, 2011, p. 605), which has been never a factor for MOOCs. This implies that MOOC learners are mainly digital natives who no longer have issues using a computer. Web technology has advanced tremendously, and MOOC providers must use innovative features in their course design and structure. In addition, MOOC learners demand more engaging multimedia activities to enhance interactivity and create a sense of community.

Both this current study and the study of Lee and Choi (2011) found that there is no clear definition of dropout in online education. Whereas dropout is commonly understood as the non-completion of a course, the argument considers the timeframe when the learner is considered to have dropped out of the course. The inconsistent definitions of dropout makes it difficult to compare dropout and retention rates across MOOCs and MOOC providers. It is therefore necessary for studies investigating dropout factors to use a clear, standard definition of dropout.

5. Conclusion

It is an established fact that over 90% of the learners in MOOCs never finish a course, which has driven scholars to investigate the factors that influence the decision to complete or drop out of a course. To deepen the understanding of the MOOC dropout phenomenon, this study conducted a systematic review of the literature to examine the factors that influence MOOC dropouts. Scholars have expressed concerns about these high dropout rates and low completion rates, and have examined this phenomenon in different ways. From the thematic analysis of the papers under investigation, four major themes emerge. Some scholars have conducted empirical studies of the dropout factors and motivations to enroll in MOOCs, whereas others have focused on predicting who and when students dropout and the factors that influence their intention to continue learning via MOOCs. Numerous scholars have concluded that predictive analytics are essential for detecting students at risk of dropping out, and thus, early intervention can be implemented to mitigate the low retention rate (Mohamad et al., 2018; Xing et al., 2016).

The results of the systematic literature review revealed several factors influencing dropouts grouped into seven themes, including course-related factors such as course design, interactivity, and web technology, and learner-related factors such as the experience of the learner, time management, language proficiency, and other personal or situational factors. Retention strategies were also presented in line with the major dropout factors; however, no proven solution has been presented, and many of these strategies remain untested. Therefore, it is recommended that empirical or case studies be conducted on the effectiveness of MOOC retention strategies. Furthermore, the majority of MOOC learners enroll in a course without the intention to complete it or obtain a certificate. These audit learners are free to select only useful modules and leave out others, and their intention is to learn more than to earn credentials (El Said, 2017). These audit learners download the materials and learn on their own without officially completing the course (Wang & Baker, 2015). Thus,

MOOC dropout and retention issues are better understood when participants' learning goals are established.

Further research should also be conducted on the implications of high dropout rates on MOOC providers in terms of institutional losses, such as financial or manpower loss. If the impact of dropouts on the institution is not significant, then effort should be focused on the quality and effectiveness of MOOCs more than on tracking students who dropped out of the course. Despite the many factors that influence the high MOOC dropout rate, the fact remains that it is the nature of a MOOC to be so because of its "openness" which results in it becoming "massive" (Eriksson et al., 2017; Xing et al., 2016). Taking this phenomenon into consideration, MOOC providers should focus their attention on increasing the completion rate of verified learners by implementing interventions and mechanisms to reduce dropouts.

This study has practical implications for MOOC providers in understanding the MOOC dropout phenomenon. It gives MOOC providers the means to discover ways to improve course design and content to retain learners and motivate them to complete the course. It is also important for MOOC providers to discover ways of engaging learners to make them feel connected and thus to create a sense of community as in face-to-face settings. If the aim of MOOCs is to provide opportunities for education at a low cost to people who are disadvantaged and geographically remote, it is necessary to engage these students and help them be successful (Greene et al., 2015). Learners who are economically and academically disadvantaged, especially those from developing countries, have a high potential to benefit from MOOCs. With the predicted trend of universities offering undergraduate degrees online via MOOCs (QS, 2016), it becomes even more necessary for research to focus on how learners from developing countries can be supported to complete MOOCs (El Said, 2017). Several universities worldwide have already started offering MOOC-based undergraduate degrees, and others are offering credits for an online MicroMasters program. This study also has implications for hospitality and tourism education, which is still in its nascent stage in the area of MOOCs, although there is no reason that this should be so. Learning from the broader education literature will fast-track the development of hospitality and tourism MOOCs.

This study is not without limitations. First, the systematic review of the literature only considered empirical studies published in peer-reviewed journals. It is likely that valuable empirical MOOC studies in conference proceedings, book chapters, technical reports, and dissertation theses were excluded from this study. Furthermore, although a substantial effort was made to include as many relevant articles as possible, the results may not be exhaustive. However, a further snowball search reached a saturation point. Second, content analysis of the articles revealed a variety of motivations and reasons why students drop out of MOOCs, and grouping these numerous dropout factors into seven themes may be parsimonious. Future studies should use statistical analysis to group the factors into significant clusters.

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