Birlesik Dünya Arastirma
BD-CENTER
Innovasyon ve Yayıncılık Merkezi

Completion factor in massive open online course in developing countries: A literature review in 2015-2021

Liliana Liliana [a] *****, Universitas Gadjah Mada, Department of Electrical Engineering and Information Technology, Jl. Grafika No.2, Daerah Istimewa Yogyakarta 55281, Indonesia / Universitas Surabaya, Department of Informatics Engineering, Jl. Raya Kalirungkut, Surabaya 60293, Indonesia. https://orcid.org/0000-0002-6550-0845

Paulus Insap Santosa [b], Universitas Gadjah Mada, Department of Electrical Engineering and Information Technology, Jl. Grafika No.2, Daerah Istimewa Yogyakarta 55281, Indonesia

Sri Suning Kusumawardani [c], Universitas Gadjah Mada, Department of Electrical Engineering and Information Technology, Jl. Grafika No.2, Daerah Istimewa Yogyakarta 55281, Indonesia

Abstract

Massive Open Online Course (MOOCs) has helped develop the education sector since the Covid-19 pandemic, though it causes low retention. This study used a systematic literature review method to analyze the factors affecting the retention level of MOOCs participants in developing countries and worldwide. A total of 89 publications in the Scopus journal during 2015-2021 and 26 published in developing countries were examined. The results showed that the factors affecting the retention level of MOOCs' participants include perceived ease of use, usefulness, social influence, and self-efficacy. However, motivation was an insignificant factor in developing countries despite being significant worldwide. Infrastructure was an internal factor for the retention level among participants, though this study can be further expanded using better methods.

Keywords: massive open online course; retention; dropout; completion; literature review; developing country

* ADDRESS FOR CORRESPONDENCE: Liliana Liliana, Departement of Electrical Engineering and Information Technology, Universitas Gadjah Mada, Jl. Grafika No.2, Daerah Istimewa Yogyakarta 55281, Indonesia; Department of Informatics Engineering, Universitas Surabaya, Jl. Raya Kalirungkut, Surabaya 60293, Indonesia.
 E-mail address: liliana@mail.ugm.ac.id, lili@staff.ubaya.ac.id / Tel.: +62 811-3101-718

1. Introduction

The COVID 19 pandemic has changed different social lives, including education (Yang & Lee, 2021). Restrictions, such as social distancing and the weakening of global economic conditions, prevented some people from accessing lectures with a complete curriculum. Therefore, the Massive Open Online Course (MOOCs) concept allows studies without face-to-face lecturers. This gives the participants a flexible selection of materials and the study time (Rawat et al., 2021), making it the best solution for the pandemic (Adamopoulos, 2013; AU Khan et al., 2021; Liyanagunawardena et al., 2013).

MOOCs is a platform developed by George Siemens and Stephen Downes in 2008 that uses the basic concept of e-learning (Baturay, 2015) to ease the access to education and learn at their base for free (Adamopoulos, 2013; Hew & Cheung, 2014). This platform has developed from delivery methods to financing education and informal learning to a recognized certification (Bozkurt et al., 2017). This is indicated by increased digital-based education service systems (Kumar et al., 2019). Various studies showed that two groups of MOOCs had been developed to date (Al-Emran et al., 2018); cMOOC and xMOOC (Bozkurt et al., 2017; Hew & Cheung, 2014). The concept comprises an online community with a common interest in a given content area using personal interactions and social media to learn and share collective knowledge. Furthermore, the learning process can change according to the participants' needs, moderated by an instructor (Hew & Cheung, 2014; Rodriguez, 2012). However, the concept has encountered several obstacles, such as formally assessing the participants' work in cases where they are not at the same phase (Rodriguez, 2012). MOOCs are derived from the word extended and are similar to conventional learning. In this case, a tutor is the center of education, and the participants choose the material without committing to the curriculum flow. This concept is widely applied to current MOOCs, such as Coursera and EduX (Hew & Cheung, 2014; Khalil & Ebner, 2014).

These platforms face significant problems, including low retention value, reaching 5-10% (Fririksdóttir, 2021; Goopio & Cheung, 2021). The pass rate is used to measure the course's quality, which lowers the retention rate (Jingjing Zhang et al., 2021). However, there is an increasing trend of studies focusing on MOOCs issues, indicated by the number of publications. Figure 1 shows a significant increase in publications with the keyword "retention MOOC" from Google Scholar in 2016-2021. This indicates that these problems are continuously experienced, with low retention rates (AU Khan et al., 2021).
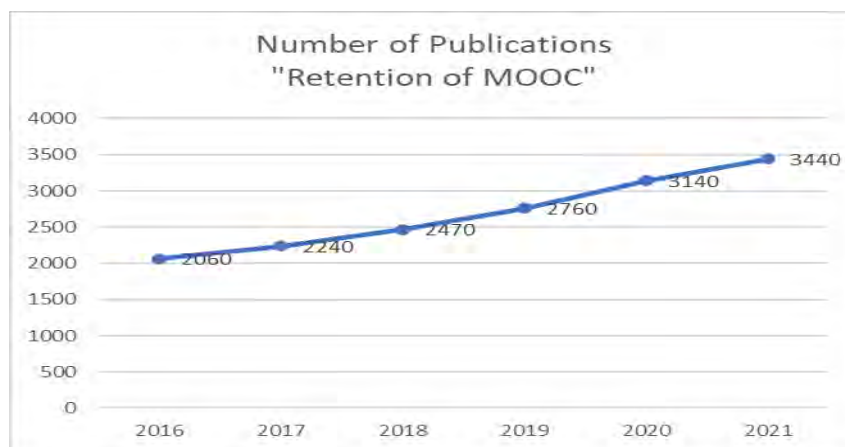

Figure 1. Retention of MOOCs' Trend

Various studies have examined the factors that increase retention rates in students taking MOOCs sessions (Abdullah & Ward, 2016; Al-Emran et al., 2018; Hew & Cheung, 2014; Kumar et al., 2019; Panigrahi et al., al., 2018; Paton et al., 2018), to improve its structure (de Barba et al., 2020). Several factors determine low retention rates in MOOCs (Deshpande & Chukhlomin, 2017), including internal (de Barba et al., 2020; Shukor & Abdullah, 2019) and external (Fririksdóttir, 2021). Several studies aimed to identify the determinants that increase the retention of MOOCs. Paton et al. (2018) stated that the experience factors of participants, materials, and interactions determine one's intention to complete the study. Furthermore, Badali et al. (2022) indicated that motivation is essential in increasing retention. Another study used a predictor algorithm to determine the dropout tendency in students at MOOCs (Greene et al., 2015; Panagiotakopoulos et al., 2021).

Most of these studies were conducted in developed countries because they have effectively used MOOCs and have a sound support system (Deng et al., 2019). In contrast, it is unpopular in developing countries due to unmet fundamental needs, such as inadequate infrastructure (Alhazzani, 2020; IU Khan et al., 2018), unstable financial conditions (Arhin & Wang'Eri, 2018; Khalil & Ebner, 2014), insecurity in the use of foreign languages (C. Liu et al., 2021; Ruipérez-Valiente et al., 2020a), and mastery of new technologies (Hong et al., 2021). This limits the use of MOOCs in developing countries than in developed ones (Lambert, 2020; Lubis et al., 2020; Van De Oudeweetering & Agirdag, 2018).

This study aimed to identify factors that influence participants' acceptance of MOOCs and their intentions to complete their studies, using the systematic literature review method (Bruette & Fitzig, 1993). There was a further exploration by sorting the research locations from each publication and collecting data in developing countries. Understanding the factors that influence retention rates on MOOCs worldwide and in developing countries will create new insights on its development and use without referencing developed countries, hence can be adapted to their needs (Bonk et al., 2018; Ruipérez-Valiente et al., 2020b).

The research questions included the following:

RQ1: What methods are commonly used in these studies?

RQ2: Which countries conduct most of these studies?

RQ3: What factors affect retention in MOOCs worldwide?

RQ4: What factors affect retention in MOOCs in developing countries?

Overall, this study had three main sections, including discussing the publications' selection method used as a reference, literature studies with supporting data, and presenting the conclusions.

2. Research Method

The following steps were applied: (1) formulating the research questions, (2) determining the criteria, (3) developing searching strategies, (4) assessments, (5) extracting data, (6) analyzing the results, and (7) stating the findings (Lockwood & Oh, 2017). Figure 2 shows the flow of the literature study.

2.1. Search Strategy and Exclusion Criteria

This study was conducted by collecting various papers on MOOCs, with the keywords (MOOC or MOOCs or distance learning) and (retention or dropout or completion rate or Technology Acceptance Model (TAM) or Unified Theory of Acceptance and Use of Technology (UTAUT) or TAM2) and Higher Education. This process obtained 205 papers from various publications drawn from multiple sources, such as Elsevier, Emerald, SAGE, Springer, Taylor and Francis, Wiley, ScienceDirect, and Google Scholar.

The papers that did not meet the criteria were excluded, including those not written in English, published before 2015, without full-text version, not in the form of a published journal, and unregistered with Scimago.

2.2. Data Collection Process

Data were extracted from 205 publications according to the predetermined criteria, reducing the number to 131, limited to Scopus indexed journals. The proportion was 86% Q1, such as Journal of Economic Perspectives, Computers and Education, Computers in Human Behavior, Information and Management, American Educational Research Journal, Future Generation Computer Systems, and International Journal of Information Management. Furthermore, 10% Q2 included Information Economics and Policy, Information Systems and e-Business Management, Electronics (Switzerland), and Asia Pacific Education Review. In comparison, 4% Q3 had Studies in Health Technology & Informatics, International Journal of Lifelong Education, and Turkish Online Journal of Distance Education.
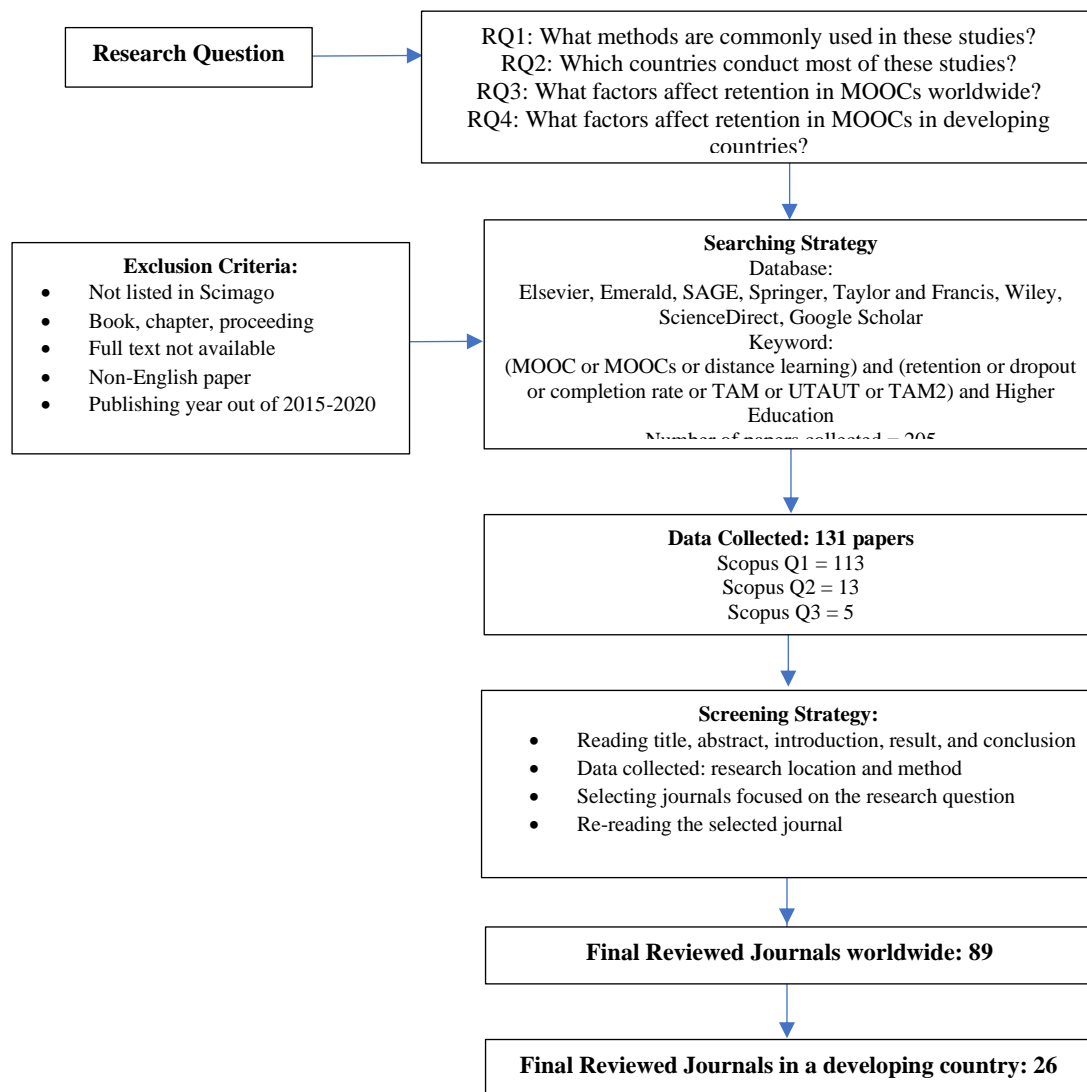

Figure 2. Flow diagram of the systematic literature review process

2.3. Data Analysis

The analysis was conducted by researchers with a teaching background in technology. The strategies used included (1) reading the title, abstraction, background, and conclusions on each paper, and (2) collecting information on the form, location, and the research methods. The screening process was conducted in 2 stages, (1) sorting 131 papers into 89, which followed the research question. This captured the dominant factors influencing MOOCs' retention worldwide. The next step involved pre-separating the papers into 26 based on the research location. Furthermore, the research locations in developing countries were considered in the second phase (QI2021, 2020). The second phase captured the dominant factors influencing MOOCs retention in developing countries.

3. Results

3.1. RQ1: The spread of method

A total of 33% of the 89 papers used the TAM method, which is considered highly qualified and worthy in similar studies. Another widely used method in research on retention in MOOCs is users observation, considering the factors in the TAM method (Hone & El Said, 2016; Howarth et al., 2016; Jingjing Zhang et al., 2021). These numbers are presented in Table 1.

Table 1. Methods used in research

No	Research Methodology	Number of Publications
1	TAM	29
2	Observation	24
3	Literature Review	17
4	Survey	16
5	Predictor	3
	Total	89

3.2. RQ2: The spread of research location countries

Up to 38% of the research was conducted in Asia, 20% in Europe, America with 15%, and 27% in the rest of the world. Table 2 shows the distribution of research locations, with 26 publications conducted in developing countries represented with an asterisk (*) (QI2021, 2020). However, there were insufficient studies on the retention of MOOCs in developing countries. As a result, the Asian region dominates 52% of similar publications in developing countries.

Table 2. Research locations

No	Country	Area	Num of Publications	No	Country	Area	Num of Publications
1	USA	America	11	16	Azerbaijan*	Asia	1
2	China	Asia	10	17	Bangladesh*	Asia	1
3	Worldwide	-	9	18	Chile*	America	1
4	Pakistan*	Asia	5	19	Estonia*	Europe	1
5	Europe	Europe	4	20	Indonesia*	Asia	1
6	Espanyol	Europe	4	21	Iceland	Europe	1
7	developing countries*	-	4	22	Israel	Middle East	1
8	Taiwan	Asia	3	23	Laos*	Asia	1
9	UK	Europe	3	24	Egypt*	Africa	1

10	Australia	Australia	2	**25**	Palestine*	Asia	1
11	Iran*	Asia	2	**26**	Russia*	Europe	1
12	Malaysia*	Asia	2	**27**	Saudi Arabia*	Middle East	1
13	Portugal	Europe	2	**28**	Turkey*	Middle East	1
14	South Korea	Asia	2	**29**	Vietnam*	Asia	1
15	Africa*	Africa	1	**30**	Jordanian*	Middle East	1

3.3. RQ3: The factors that affect retention in MOOC worldwide

The findings for each study were mapped and grouped, dividing them into external and internal factors influenced by user conditions and system quality, respectively. The external factors affecting retention at MOOCs worldwide are shown in Table 3, including motivation, perceived usefulness, and social influence. In contrast, the internal factors were presented in Table 4, covering content, perceived enjoyment, and infrastructure.

The UTAUT concept consists of several demographic factors, such as age, gender, and experience (Venkatesh et al., 2003). In addition, demographic conditions influence the characteristics of digital learners (Witt & Baird, 2018). This study included some demographic factors found in surveys conducted in various publications, as exhibited in Table 5. In line with the UTAUT concept, age and sex were the most used demographic factors. Furthermore, participants' experience and education were considered demographic factors in the retention of a MOOC system.

3.4. RQ4: The factors that affect retention in MOOC in developing countries

Digital learning is a significant portion of education (Alvi, 2018; Hussein, 2017). Therefore, education technology investments should be prioritized, especially in developing countries worldwide (Hongthong & Temdee, 2018; C. Liu et al., 2021; Ngampornchai & Adams, 2016). Tables 6 and 7 showed external and internal factors mapping, respectively.

There are significant differences in factors that affect retention rates at MOOCs worldwide and in developing countries, namely the perceived ease of use and motivation. Additionally, developing countries consider education as crucial than experience in using MOOCs because this approach is relatively new (Ngampornchai & Adams, 2016). In most cases, it is assumed that higher education level enhances the retention rate of the MOOC.

4. Discussion

This study aimed to examine the factors determining the retention rate of MOOCs in developing countries. The results showed that perceived ease of use had a significant influence. This was in line with Hossein's research, which stated that eastern cultural areas valued perceived ease of use more than usefulness (Mohammadi, 2015b). Generally, learners benefit more from an easy-to-use system (Mohammadi, 2015b; Tarhini et al., 2013).

The social influence shows the level of environmental impact on a person (Cacciamani, 2017). For example, when certain items have more users, the higher the desire to possess them. Additionally, learners emulate various social influences, including the willingness of parents, respected individuals in the society (Briz-Ponce et al., 2017; Ngampornchai & Adams, 2016; Poong et al., 2017), or the view of peers, recommending certain MOOCs (Sabah, 2016; Wu & Chen, 2017; Zhao et al., 2020).

Table 3. External factor

No	Factors	Publications	Number of Publications
1	Motivation	(Badali et al., 2022; Briz-Ponce et al., 2017; Dai, Teo, Rappa, et al., 2020; Fririksdóttir, 2021; Goopio & Cheung, 2021; Greene et al., 2015; Gregori et al., 2018; Hood et al., 2015; Joo et al., 2018; E. Jung et al., 2019; B. Li et al., 2018; Q. Li & Baker, 2018; S. Li et al., 2020; Littlejohn et al., 2016; Lung-Guang, 2019; Martin et al., 2020; Mohammadi, 2015b, 2015a; Ortega-Arranz et al., 2019; Panigrahi et al., 2018; Pozón-López et al., 2021; Rawat et al., 2021; Reparaz et al., 2020; Shapiro et al., 2017; Stich & Reeves, 2017; Tsai et al., 2018; Veletsianos & Shepherdson, 2016; Watted & Barak, 2018; Williams et al., 2018; Wu & Chen, 2017; Jie Zhang, 2016; Q. Zhang et al., 2019; Zhou, 2016; Zhu et al., 2018)	34
2	Perceived Usefulness	(Abdullah & Ward, 2016; Al-Emran et al., 2018; Al-Fraihat et al., 2020; Almaiah, 2018; Alraimi et al., 2015; Briz-Ponce et al., 2017; Cheng, 2015; Ching-Ter et al., 2017; Dai, Teo, Rappa, et al., 2020; Dai, Teo, & Rappa, 2020; Hoi, 2020; Hone & El Said, 2016; Howarth et al., 2016; Joo et al., 2018; Y. Jung & Lee, 2018; D. Liu & Guo, 2017; Mohammadi, 2015b, 2015a; Nadlifatin et al., 2020; Nikou & Economides, 2017a, 2017b; Panigrahi et al., 2018; Poong et al., 2017; Pozón-López et al., 2021; Raza et al., 2017; Reparaz et al., 2020; Sabah, 2016; Wanted & Barak, 2018; Wu & Chen, 2017; Jingjing Zhang et al., 2021)	30
3	Social Influence	(Abdullah & Ward, 2016; Briz-Ponce et al., 2017; Ching-Ter et al., 2017; Dewberry & Jackson, 2018; Fang et al., 2019; Hoi, 2020; Iqbal & Bhatti, 2016; A. U. Khan et al., 2021; I. U. Khan et al., 2018; K. Li, 2019; Q. Li & Baker, 2018; Lung-Guang, 2019; Mohammadi, 2015b; Nadlifatin et al., 2020; Nikou & Economides, 2017a; Panigrahi et al., 2018; Poong et al., 2017; Raza et al., 2017; Sabah, 2016; Van De Oudeweetering & Agirdag, 2018; Veletsianos & Shepherdson, 2016; Wu & Chen, 2017; Yang & Lee, 2021; Zhao et al., 2020; Zhou, 2016)	25
4	Perceived Ease of Use	(Abdullah & Ward, 2016; Al-Emran et al., 2018; Almaiah, 2018; Briz-Ponce et al., 2017; Cheng, 2015; Ching-Ter et al., 2017; Hoi, 2020; Hone & El Said, 2016; Howarth et al., 2016; Joo et al., 2018; Y. Jung & Lee, 2018; Koç et al., 2016; D. Liu & Guo, 2017; Mohammadi, 2015a, 2015b; Nadlifatin et al., 2020; Nikou & Economides, 2017b, 2017a; Panigrahi et al., 2018; Poong et al., 2017; Pozón-López et al., 2021; Raza et al., 2017; Sabah, 2016; Wu & Chen, 2017)	24
5	Self-Efficacy	(Abdullah & Ward, 2016; Bakhsh et al., 2017; Bozkurt et al., 2017; Briz-Ponce et al., 2017; Ching-Ter et al., 2017; Dewberry & Jackson, 2018; Fatima et al., 2017; Jaggars & Xu, 2016; Lambert, 2020; Littlejohn et al., 2016; C. Liu et al., 2021; Lung-Guang, 2019; Mohammadi, 2015b; Nikou & Economides, 2017b, 2017a; Panigrahi et al., 2018; Poong et al., 2017; Raza et al., 2017; Rõõm et al., 2021; Ruipérez-Valiente et al., 2020; Tsai et al., 2018)	21
6	Satisfaction	(Al-Fraihat et al., 2020; Alraimi et al., 2015; Aparicio et al., 2019; Dai, Teo, & Rappa, 2020; Dai, Teo, Rappa, et al., 2020; Fang et al., 2019; Joo et al., 2018; Littlejohn et al., 2016; Mohammadi, 2015b, 2015a; Navío-Marco & Solórzano-García, 2021; Ortega-Arranz et al., 2019; Panigrahi et al., 2018; Pozón-López et al., 2021)	14

No	Factors	Publications	Number of Publications
7	Time Commitment	(Fririksdóttir, 2021; Goopio & Cheung, 2021; Y. Jung & Lee, 2018; I. U. Khan et al., 2018; Kizilcec et al., 2017; B. Li et al., 2018; D. Liu & Guo, 2017; Martinez-Lopez et al., 2017; Sabah, 2016; Shapiro et al., 2017; Wu & Chen, 2017; Zhao et al., 2020)	12
8	Perceived Enjoyment	(Abdullah & Ward, 2016; Alraimi et al., 2015; Ching-Ter et al., 2017; Iqbal & Bhatti, 2016; Poong et al., 2017; Yang & Lee, 2021)	6
9	Trust	(Almaiah, 2018; Koç et al., 2016; D. Liu & Guo, 2017; Nikou & Economides, 2017a; Panigrahi et al., 2018)	5
10	Cost	(Lambert, 2020; D. Liu & Guo, 2017; McPherson & Bacow, 2015; Van De Oudeweetering & Agirdag, 2018)	4

Tabel 4. Internal Factor

No	Factors	Publications	Num of Publications
1	Content	(Almaiah, 2018; C. J. Chung et al., 2019; de Barba et al., 2020; Goopio & Cheung, 2021; Hone & El-Said, 2016; Hood et al., 2015; Jaggars & Xu, 2016; A. U. Khan et al., 2021; Q. Li & Baker, 2018; C. Liu et al., 2021; Mohammadi, 2015a; Nikou & Economides, 2017b, 2017a; Panagiotakopoulos et al., 2021; Paton et al., 2018; Pozón-López et al., 2021; Pursel et al., 2016; Rawat et al., 2021; Rõõm et al., 2021; Shukor & Abdullah, 2019; Wang et al., 2020; Jingjing Zhang et al., 2021; Zhu et al., 2018)	23
2	Interaction	(Bonk et al., 2018; Goopio & Cheung, 2021; Gregori et al., 2018; Hone & El Said, 2016; A. U. Khan et al., 2021; C. Liu et al., 2021; Navío-Marco & Solórzano-García, 2021; Nikou & Economides, 2017b; Panigrahi et al., 2018; Paton et al., 2018; Pozón-López et al., 2021; Pursel et al., 2016; Reparaz et al., 2020; Shukor & Abdullah, 2019; Wang et al., 2020; Yang & Lee, 2021; Zhao et al., 2020)	17
3	Infrastructure	(Al-Fraihat et al., 2020; Bakhsh et al., 2017; Briz-Ponce et al., 2017; Deng et al., 2019; Hoi, 2020; Koç et al., 2016; Lambert, 2020; Mohammadi, 2015a; Nikou & Economides, 2017a; Panigrahi et al., 2018; Poong et al., 2017; Sabah, 2016; Shapiro et al., 2017; Van De Oudeweetering & Agirdag, 2018)	14

Table 5. Demographic factors

Demographic Info	Number of Publications
Experience	26
Age	24
Gender	24
Education Level	20
Type of Work	7

Table 6. External factors in developing countries

No	Factors	Number of Publications	No	Factors	Number of Publications
1	Perceived Ease of Use	13	6	Motivation	3
2	Perceived Usefulness	12	7	Perceived Enjoyment	3
3	Social Influence	11	8	Trust	3
4	Self-Efficacy	9	9	Satisfaction	2
5	Time Commitment	6	10	Cost	2

Table 7. Internal factors in developing countries

No	Factors	Number of Publications
1	Infrastructure	13
2	Content	12
3	Interaction	2

Self-efficacy shows one's confidence level when dealing with specific tasks (Ajzen, 2002). This is measured by how one perceives the importance of MOOCs (Park et al., 2012), their level of courage in learning new things through an unfamiliar system due to lack of gadgets (Hsiao & Chen, 2015; Park et al., 2012), user experience (Briz-Ponce et al., 2017; Mohammadi, 2015b), or language used (H.-H. Chung et al., 2015). Language is one of the problems MOOCs face in developing countries (C. Liu et al., 2021; Ruipérez-Valiente et al., 2020a). This is because English is their second language, which most reputable MOOCs use in instructions.

The abovementioned factors are closely related to motivation (Davis et al., 1992; Douglas et al., 2020; Rowley, 2005; Seemiller, 2017). Supportive social influence and high self-efficacy increase the motivation to complete any task, considering one's level of confidence that the MOOC used is good for them (B. Li et al., 2018). Additionally, motivation is affected by curiosity (Douglas et al., 2020; Thompson & Gregory, 2012), the need to learn (Littlejohn et al., 2016), and advanced career (Douglas et al., 2020; Littlejohn et al., 2016). However, motivational factors are not dominant in developing countries because some participants study to fulfill their work obligations (Van De Oudeweetering & Agirdag, 2018).

Physical infrastructure and supporting regulations influence MOOC's retention rate in most countries (Antonelli, 2017). Inequality in infrastructure development causes differences in access to basic needs between regions (Chotia & Rao, 2017), such as the internet. For instance, inconsistent internet interferes with access to the MOOC (Shapiro et al., 2017), affecting system satisfaction (Al-Fraihat et al., 2020).

Besides the discussed factors, there are no significant differences between other parts of the world and developing countries. This excludes the order between perceived ease of use and usefulness, similar to previous research, which showed that developing countries focus on perceived ease of use (Mohammadi, 2015b).

5. Conclusion

MOOC has the potential for equal distribution of education in developing countries. However, the problem of low retention rate lacks a suitable solution. This has increased the number of studies

Liliana, L., Santosa, P. I., & Kusumawardani, S. S. (2022). Completion factor in massive open online course in developing countries: A literature review in 2015-2021. *World Journal on Educational Technology: Current Issues*. *14*(2), 456-472. https://doi.org/10.18844/wjet.v14i2.6919

attempting to identify various factors to develop strategies in increasing MOOC retention. They focus on internal and external factors influenced by the system design and users, respectively. This study explored 89 publications worldwide, then filtered into 26 items for developing countries. The results found that the most important external factors in the retention rate of the MOOC system in developing countries included the perceived ease of use, usefulness, social influence, and self-efficacy. In contrast, the internal factors included the infrastructure and course content. The Scopus journals limited the number of publications in developing countries, making the results incomplete. Additionally, there may be studies in conference proceedings reports, books, thesis, and other articles. Future studies can consider more factors and structured statistical tests to achieve more significant results.

6. Author's Note

The authors declare no conflict of interest in the publication of this article and confirm that it is free of plagiarism.

References

Abdullah, F., & Ward, R. (2016). Developing a General Extended Technology Acceptance Model for E-Learning (GETAMEL) by analyzing commonly used external factors. Computers in Human Behavior, 56, 238–256. https://doi.org/10.1016/j.chb.2015.11.036

Adamopoulos, P. (2013). What makes a great MOOC? An interdisciplinary analysis of student retention in online courses. The ICIS 2013. https://aisel.aisnet.org/icis2013/proceedings/BreakthroughIdeas/13/

Ajzen, I. (2002). Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior. Journal of Applied Social Psychology, 32(4), 665–683. https://doi.org/10.1111/j.1559-1816.2002.tb00236.x

Al-Emran, M., Mezhuyev, V., & Kamaludin, A. (2018). Technology Acceptance Model in M-learning context: A systematic review. Computers and Education, 125(August 2017), 389–412. https://doi.org/10.1016/j.compedu.2018.06.008

Al-Fraihat, D., Joy, M., Masa'deh, R., & Sinclair, J. (2020). Evaluating E-learning systems success: An empirical study. Computers in Human Behavior, 102(March 2019), 67–86. https://doi.org/10.1016/j.chb.2019.08.004

Alhazzani, N. (2020). MOOC's impact on higher education. Social Sciences & Humanities Open, 2(1), 100030. https://doi.org/10.1016/j.ssaho.2020.100030

Almaiah, M. A. (2018). Acceptance and usage of a mobile information system services in University of Jordan. Education and Information Technologies, 23(5), 1873–1895. https://doi.org/10.1007/s10639-018-9694-6

Alraimi, K. M., Zo, H., & Ciganek, A. P. (2015). Understanding the MOOCs continuance: The role of openness and reputation. Computers and Education, 80, 28–38. https://doi.org/10.1016/j.compedu.2014.08.006

Alvi, S. (2018). Marrying Digital and Analog with Generation Z: Confronting the Moral Panic of Digital Learning in Late Modern Society. Studies in Health Technology & Informatics, 256, 444–453. https://doi.org/10.3233/978-1-61499-923-2-444

Antonelli, C. (2017). Digital knowledge generation and the appropriability trade-off. Telecommunications Policy, 41(10), 991–1002. https://doi.org/10.1016/j.telpol.2016.12.002

Aparicio, M., Oliveira, T., Bacao, F., & Painho, M. (2019). Gamification: A key determinant of massive open online course (MOOC) success. Information and Management, 56(1), 39–54. https://doi.org/10.1016/j.im.2018.06.003

Liliana, L., Santosa, P. I., & Kusumawardani, S. S. (2022). Completion factor in massive open online course in developing countries: A literature review in 2015-2021. *World Journal on Educational Technology: Current Issues*. *14*(2), 456-472. https://doi.org/10.18844/wjet.v14i2.6919

Arhin, V., & Wang'Eri, T. (2018). Orientation programs and student retention in distance learning: The case of university of cape coast. Journal of Educators Online, 15(1). https://doi.org/10.9743/JEO2018.15.1.6

Badali, M., Hatami, J., Banihashem, S. K., Rahimi, E., Noroozi, O., & Eslami, Z. (2022). The role of motivation in MOOCs' retention rates: a systematic literature review. Research and Practice in Technology Enhanced Learning, 17(1). https://doi.org/10.1186/s41039-022-00181-3

Bakhsh, M., Mahmood, A., & Sangi, N. A. (2017). Examination of factors influencing students and faculty behavior towards m-learning acceptance: An empirical study. International Journal of Information and Learning Technology, 34(3), 166–188. https://doi.org/10.1108/IJILT-08-2016-0028

Baturay, M. H. (2015). An Overview of the World of MOOCs. Procedia - Social and Behavioral Sciences, 174, 427–433. https://doi.org/10.1016/j.sbspro.2015.01.685

Bonk, C. J., Zhu, M., Kim, M., Xu, S., Sabir, N., & Sari, A. R. (2018). Pushing Toward a More Personalized MOOC: Exploring Instructor Selected Activities, Resources, and Technologies for MOOC Design and Implementation. International Review of Research in Open and Distributed Learning, 19(4). https://www.erudit.org/en/journals/irrodl/2018-v19-n4-irrodl04233/1055530ar.pdf

Bozkurt, A., Akgün-özbek, E., & Zawacki-Richter, O. (2017). Trends and patterns in massive open online courses: Review and content analysis of research on MOOCs (2008-2015). International Review of Research in Open and Distance Learning, 18(5), 118–147. https://doi.org/10.19173/irrodl.v18i5.3080

Briz-Ponce, L., Pereira, A., Carvalho, L., Juanes-Méndez, J. A., & García-Peñalvo, F. J. (2017). Learning with mobile technologies – Students' behavior. Computers in Human Behavior, 72, 612–620. https://doi.org/10.1016/j.chb.2016.05.027

Cacciamani, S. (2017). Experimental Learning and Knowledge Building in Higher Education. Journal of E-Learning and Knowledge Society, 13(1), 27–38. https://www.learntechlib.org/p/188122/

Cheng, Y. M. (2015). Towards an understanding of the factors affecting m-learning acceptance: Roles of technological characteristics and compatibility. Asia Pacific Management Review, 20(3), 109–119. https://doi.org/10.1016/j.apmrv.2014.12.011

Ching-Ter, C., Hajiyev, J., & Su, C. R. (2017). Examining the students' behavioral intention to use e-learning in Azerbaijan? The General Extended Technology Acceptance Model for E-learningapproach. Computers and Education, 111, 128–143. https://doi.org/10.1016/j.compedu.2017.04.010

Chotia, V., & Rao, N. V. M. (2017). Investigating the interlinkages between infrastructure development, poverty and rural-urban income inequality: Evidence from BRICS nations. Studies in Economics and Finance, 34(4), 466–484. https://doi.org/10.1108/SEF-07-2016-0159

Chung, C. J., Hwang, G. J., & Lai, C. L. (2019). A review of experimental mobile learning research in 2010–2016 based on the activity theory framework. Computers and Education, 129(October 2018), 1–13. https://doi.org/10.1016/j.compedu.2018.10.010

Chung, H.-H., Chen, S.-C., & Kuo, M.-H. (2015). A Study of EFL College Students' Acceptance of Mobile Learning. Procedia - Social and Behavioral Sciences, 176, 333–339. https://doi.org/10.1016/j.sbspro.2015.01.479

Dai, H. M., Teo, T., & Rappa, N. A. (2020). Understanding continuance intention among MOOC participants: The role of habit and MOOC performance. Computers in Human Behavior, 106455. https://doi.org/10.1016/j.chb.2020.106455

Dai, H. M., Teo, T., Rappa, N. A., & Huang, F. (2020). Explaining Chinese university students' continuance learning intention in the MOOC setting: A modified expectation confirmation model perspective. Computers and Education, 150(January), 103850. https://doi.org/10.1016/j.compedu.2020.103850

Liliana, L., Santosa, P. I., & Kusumawardani, S. S. (2022). Completion factor in massive open online course in developing countries: A literature review in 2015-2021. *World Journal on Educational Technology: Current Issues*. *14*(2), 456-472. https://doi.org/10.18844/wjet.v14i2.6919

de Barba, P. G., Malekian, D., Oliveira, E. A., Bailey, J., Ryan, T., & Kennedy, G. (2020). The importance and meaning of session behaviour in a MOOC. Computers and Education, 146(November 2019), 103772. https://doi.org/10.1016/j.compedu.2019.103772

Deng, R., Benckendorff, P., & Gannaway, D. (2019). Progress and new directions for teaching and learning in MOOCs. Computers and Education, 129(July 2018), 48–60. https://doi.org/10.1016/j.compedu.2018.10.019

Deshpande, A., & Chukhlomin, V. (2017). What Makes a Good MOOC: A Field Study of Factors Impacting Student Motivation to Learn. American Journal of Distance Education, 31(4), 275–293. https://doi.org/10.1080/08923647.2017.1377513

Dewberry, C., & Jackson, D. J. R. (2018). An application of the theory of planned behavior to student retention. Journal of Vocational Behavior, 107, 100–110. https://doi.org/10.1016/j.jvb.2018.03.005

Douglas, K. A., Merzdorf, H. E., Hicks, N. M., Sarfraz, M. I., & Bermel, P. (2020). Challenges to assessing motivation in MOOC learners: An application of an argument-based approach. Computers and Education, 150(September 2019), 103829. https://doi.org/10.1016/j.compedu.2020.103829

Fang, J., Tang, L., Yang, J., & Peng, M. (2019). Social interaction in MOOCs: The mediating effects of immersive experience and psychological needs satisfaction. Telematics and Informatics, 39(October 2018), 75–91. https://doi.org/10.1016/j.tele.2019.01.006

Fatima, J. K., Ghandforoush, P., Khan, M., & Marsico, R. di. (2017). Role of innovativeness and self-efficacy in tourism m-learning. Tourism Review. https://doi.org/10.1108/TR-02-2017-0019

Fririksdóttir, K. (2021). The effect of content-related and external factors on student retention in MOOCs. ReCALL, 33(2), 128–142. https://doi.org/10.1017/S0958344021000069

Goopio, J., & Cheung, C. (2021). The MOOC dropout phenomenon and retention strategies. Journal of Teaching in Travel and Tourism, 21(2), 177–197. https://doi.org/10.1080/15313220.2020.1809050

Greene, J. A., Oswald, C. A., & Pomerantz, J. (2015). Predictors of Retention and Achievement in a Massive Open Online Course. American Educational Research Journal, 52(5), 925–955. https://doi.org/10.3102/0002831215584621

Gregori, E. B., Zhang, J., Galván-Fernández, C., & Fernández-Navarro, F. de A. (2018). Learner support in MOOCs: Identifying variables linked to completion. Computers and Education, 122(March), 153–168. https://doi.org/10.1016/j.compedu.2018.03.014

Hew, K. F., & Cheung, W. S. (2014). Students' and instructors' use of massive open online courses (MOOCs): Motivations and challenges. Educational Research Review, 12, 45–58. https://doi.org/10.1016/j.edurev.2014.05.001

Hoi, V. N. (2020). Understanding higher education learners' acceptance and use of mobile devices for language learning: A Rasch-based path modeling approach. Computers and Education, 146(August 2019), 103761. https://doi.org/10.1016/j.compedu.2019.103761

Hone, K. S., & El Said, G. R. (2016). Exploring the factors affecting MOOC retention: A survey study. Computers and Education, 98, 157–168. https://doi.org/10.1016/j.compedu.2016.03.016

Hong, J. C., Hsiao, H. S., Chen, P. H., Lu, C. C., Tai, K. H., & Tsai, C. R. (2021). Critical attitude and ability associated with students' self-confidence and attitude toward "predict-observe-explain" online science inquiry learning. Computers and Education, 166(February 2020). https://doi.org/10.1016/j.compedu.2021.104172

Hongthong, T., & Temdee, P. (2018). Personalized mobile learning for digital literacy enhancement of Thai youth. 2018 International Workshop on Advanced Image Technology, IWAIT 2018, 1–4. https://doi.org/10.1109/IWAIT.2018.8369683

Liliana, L., Santosa, P. I., & Kusumawardani, S. S. (2022). Completion factor in massive open online course in developing countries: A literature review in 2015-2021. *World Journal on Educational Technology: Current Issues*. *14*(2), 456-472. https://doi.org/10.18844/wjet.v14i2.6919

Hood, N., Littlejohn, A., & Milligan, C. (2015). Context counts: How learners' contexts influence learning in a MOOC. Computers and Education, 91, 83–91. https://doi.org/10.1016/j.compedu.2015.10.019

Howarth, J. P., D'Alessandro, S., Johnson, L., & White, L. (2016). Learner motivation for MOOC registration and the role of MOOCs as a university 'taster.' International Journal of Lifelong Education, 35(1), 74–85. https://doi.org/10.1080/02601370.2015.1122667

Hsiao, K. L., & Chen, C. C. (2015). How do we inspire children to learn with e-readers? Library Hi Tech, 33(4), 584–596. https://doi.org/10.1108/LHT-04-2015-0038

Hussein, Z. (2017). Leading to Intention: The Role of Attitude in Relation to Technology Acceptance Model in E-Learning. Procedia Computer Science, 105(December 2016), 159–164. https://doi.org/10.1016/j.procs.2017.01.196

Iqbal, S., & Bhatti, Z. A. (2016). What drives m-learning ? An empirical investigation of university student perceptions in Pakistan. Higher Education Research & Development, 0(0), 1–17. https://doi.org/10.1080/07294360.2016.1236782

Jaggars, S. S., & Xu, D. (2016). How do online course design features influence student performance? Computers and Education, 95, 270–284. https://doi.org/10.1016/j.compedu.2016.01.014

Joo, Y. J., So, H. J., & Kim, N. H. (2018). Examination of relationships among students' self-determination, technology acceptance, satisfaction, and continuance intention to use K-MOOCs. Computers and Education, 122(April 2017), 260–272. https://doi.org/10.1016/j.compedu.2018.01.003

Jung, E., Kim, D., Yoon, M., Park, S., & Oakley, B. (2019). The influence of instructional design on learner control, sense of achievement, and perceived effectiveness in a supersize MOOC course. Computers and Education, 128(July 2018), 377–388. https://doi.org/10.1016/j.compedu.2018.10.001

Jung, Y., & Lee, J. (2018). Learning Engagement and Persistence in Massive Open Online Courses (MOOCS). Computers and Education, 122(April 2017), 9–22. https://doi.org/10.1016/j.compedu.2018.02.013

Khalil, H., & Ebner, M. (2014). MOOCs Completion Rates and Possible Methods to Improve Retention - A Literature Review. EdMedia: World Conference on Educational Media and Technology, 2014(1), 1305–1313. https://www.learntechlib.org/primary/p/147656/

Khan, A. U., Khan, K. U., Atlas, F., Akhtar, S., & Khan, F. (2021). Critical factors influencing MOOCs retention: The mediating role of information technology. Turkish Online Journal of Distance Education, 22(4), 82–101. https://doi.org/10.17718/tojde.1002776

Khan, I. U., Hameed, Z., Yu, Y., Islam, T., Sheikh, Z., & Khan, S. U. (2018). Predicting the acceptance of MOOCs in a developing country: Application of task-technology fit model, social motivation, and self-determination theory. Telematics and Informatics, 35(4), 964–978. https://doi.org/10.1016/j.tele.2017.09.009

Kizilcec, R. F., Pérez-Sanagustín, M., & Maldonado, J. J. (2017). Self-regulated learning strategies predict learner behavior and goal attainment in Massive Open Online Courses. Computers and Education, 104, 18–33. https://doi.org/10.1016/j.compedu.2016.10.001

Koç, T., Turan, A. H., & Okursoy, A. (2016). Acceptance and usage of a mobile information system in higher education: An empirical study with structural equation modeling. International Journal of Management Education, 14(3), 286–300. https://doi.org/10.1016/j.ijme.2016.06.001

Kumar, P., Kumar, A., Palvia, S., & Verma, S. (2019). Online business education research: Systematic analysis and a conceptual model. International Journal of Management Education, 17(1), 26–35. https://doi.org/10.1016/j.ijme.2018.11.002Lambert, S. R. (2020). Do MOOCs contribute to student equity and social inclusion? A systematic review 2014–18. Computers and Education, 145(October 2019), 103693. https://doi.org/10.1016/j.compedu.2019.103693

Liliana, L., Santosa, P. I., & Kusumawardani, S. S. (2022). Completion factor in massive open online course in developing countries: A literature review in 2015-2021. *World Journal on Educational Technology: Current Issues*. *14*(2), 456-472. https://doi.org/10.18844/wjet.v14i2.6919

Li, B., Wang, X., & Tan, S. C. (2018). What makes MOOC users persist in completing MOOCs? A perspective from network externalities and human factors. Computers in Human Behavior, 85, 385–395. https://doi.org/10.1016/j.chb.2018.04.028

Li, K. (2019). MOOC learners' demographics, self-regulated learning strategy, perceived learning and satisfaction: A structural equation modeling approach. Computers and Education, 132(January), 16–30. https://doi.org/10.1016/j.compedu.2019.01.003

Li, Q., & Baker, R. (2018). The different relationships between engagement and outcomes across participant subgroups in Massive Open Online Courses. Computers and Education, 127(April 2017), 41–65. https://doi.org/10.1016/j.compedu.2018.08.005

Li, S., Chen, G., Xing, W., Zheng, J., & Xie, C. (2020). Longitudinal clustering of students' self-regulated learning behaviors in engineering design. Computers and Education, 153(April), 103899. https://doi.org/10.1016/j.compedu.2020.103899

Littlejohn, A., Hood, N., Milligan, C., & Mustain, P. (2016). Learning in MOOCs: Motivations and self-regulated learning in MOOCs. Internet and Higher Education, 29, 40–48. https://doi.org/10.1016/j.iheduc.2015.12.003

Liu, C., Zou, D., Chen, X., Xie, H., & Chan, W. H. (2021). A bibliometric review on latent topics and trends of the empirical MOOC literature (2008–2019). Asia Pacific Education Review, 22(3), 515–534. https://doi.org/10.1007/s12564-021-09692-y

Liu, D., & Guo, X. (2017). Exploring gender differences in acceptance of mobile computing devices among college students. Information Systems and E-Business Management, 15(1), 197–223. https://doi.org/10.1007/s10257-016-0315-x

Liyanagunawardena, T. R., Adams, A. A., Williams, A., & Williams, S. A. (2013). MOOCs : A Systematic Study of the Published Literature 2008-2012. International Review of Research in Open and Distributed Learning, 3. https://doi.org/10.19173/irrodl.v14i3.1455

Lockwood, C., & Oh, E. G. (2017). Systematic reviews: Guidelines, tools and checklists for authors. Nursing and Health Sciences, 19(3), 273–277. https://doi.org/10.1111/nhs.12353

Lubis, A. H., Idrus, S. Z. S., & Rashid, S. A. (2020). The exposure of MOOC usage in Indonesia. International Journal of Scientific and Technology Research, 9(2), 2716–2720. https://bit.ly/3hSUHkg

Lung-Guang, N. (2019). Decision-making determinants of students participating in MOOCs: Merging the theory of planned behavior and self-regulated learning model. Computers and Education, 134(February), 50–62. https://doi.org/10.1016/j.compedu.2019.02.004

Martin, F., Sun, T., & Westine, C. D. (2020). A systematic review of research on online teaching and learning from 2009 to 2018. Computers and Education, 159(April), 104009. https://doi.org/10.1016/j.compedu.2020.104009

Martinez-Lopez, R., Yot, C., Tuovila, I., & Perera-Rodríguez, V. H. (2017). Online Self-Regulated Learning Questionnaire in a Russian MOOC. Computers in Human Behavior, 75, 966–974. https://doi.org/10.1016/j.chb.2017.06.015

McPherson, M. S., & Bacow, L. S. (2015). Online higher education: Beyond the hype cycle. Journal of Economic Perspectives, 29(4), 135–154. https://doi.org/10.1257/jep.29.4.135

Mohammadi, H. (2015a). Investigating users' perspectives on e-learning: An integration of TAM and IS success model. Computers in Human Behavior, 45, 359–374. https://doi.org/10.1016/j.chb.2014.07.044

Mohammadi, H. (2015b). Social and individual antecedents of m-learning adoption in Iran. Computers in Human Behavior, 49, 191–207. https://doi.org/10.1016/j.chb.2015.03.006

Liliana, L., Santosa, P. I., & Kusumawardani, S. S. (2022). Completion factor in massive open online course in developing countries: A literature review in 2015-2021. *World Journal on Educational Technology: Current Issues*. *14*(2), 456-472. https://doi.org/10.18844/wjet.v14i2.6919

Nadlifatin, R., Ardiansyahmiraja, B., & Persada, S. F. (2020). The measurement of university students' intention to use blended learning system through technology acceptance model (tam) and theory of planned behavior (TPB) at developed and developing regions: Lessons learned from Taiwan and Indonesia. International Journal of Emerging Technologies in Learning, 15(9), 219–230. https://doi.org/10.3991/ijet.v15i09.11517

Navío-Marco, J., & Solórzano-García, M. (2021). Student's social e-reputation ("karma") as motivational factor in MOOC learning. Interactive Learning Environments, 29(3), 458–472. https://doi.org/10.1080/10494820.2019.1579237

Ngampornchai, A., & Adams, J. (2016). Students' acceptance and readiness for E-learning in Northeastern Thailand. International Journal of Educational Technology in Higher Education, 13(1). https://doi.org/10.1186/s41239-016-0034-x

Nikou, S. A., & Economides, A. A. (2017a). Mobile-Based Assessment: Integrating acceptance and motivational factors into a combined model of Self-Determination Theory and Technology Acceptance. Computers in Human Behavior, 68, 83–95. https://doi.org/10.1016/j.chb.2016.11.020

Nikou, S. A., & Economides, A. A. (2017b). Mobile-based assessment: Investigating the factors that influence behavioral intention to use. Computers and Education, 109, 56–73. https://doi.org/10.1016/j.compedu.2017.02.005

Ortega-Arranz, A., Bote-Lorenzo, M. L., Asensio-Pérez, J. I., Martínez-Monés, A., Gómez-Sánchez, E., & Dimitriadis, Y. (2019). To reward and beyond: Analyzing the effect of reward-based strategies in a MOOC. Computers and Education, 142(March), 103639. https://doi.org/10.1016/j.compedu.2019.103639

Panagiotakopoulos, T., Kotsiantis, S., Kostopoulos, G., Iatrellis, O., & Kameas, A. (2021). Early dropout prediction in MOOCs through supervised learning and hyperparameter optimization. Electronics (Switzerland), 10(14). https://doi.org/10.3390/electronics10141701

Panigrahi, R., Srivastava, P. R., & Sharma, D. (2018). Online learning: Adoption, continuance, and learning outcome—A review of literature. International Journal of Information Management, 43(July 2016), 1–14. https://doi.org/10.1016/j.ijinfomgt.2018.05.005

Park, S. Y., Nam, M. W., & Cha, S. B. (2012). University students' behavioral intention to use mobile learning: Evaluating the technology acceptance model. British Journal of Educational Technology, 43(4), 592–605. https://doi.org/10.1111/j.1467-8535.2011.01229.x

Paton, R. M., Fluck, A. E., & Scanlan, J. D. (2018). Engagement and retention in VET MOOCs and online courses: A systematic review of literature from 2013 to 2017. Computers and Education, 125(June), 191–201. https://doi.org/10.1016/j.compedu.2018.06.013

Poong, Y. S., Yamaguchi, S., & Takada, J. I. (2017). Investigating the drivers of mobile learning acceptance among young adults in the World Heritage town of Luang Prabang, Laos. Information Development, 33(1), 57–71. https://doi.org/10.1177/0266666916638136

Pozón-López, I., Higueras-Castillo, E., Muñoz-Leiva, F., & Liébana-Cabanillas, F. J. (2021). Perceived user satisfaction and intention to use massive open online courses (MOOCs). In Journal of Computing in Higher Education (Vol. 33, Issue 1). Springer US. https://doi.org/10.1007/s12528-020-09257-9

Pursel, B. K., Zhang, L., Jablokow, K. W., Choi, G. W., & Velegol, D. (2016). Understanding MOOC students: Motivations and behaviours indicative of MOOC completion. Journal of Computer Assisted Learning, 32(3), 202–217. https://doi.org/10.1111/jcal.12131

QI2021. (2020). Developing countries list. https://icqi.org/developing-countries-list/

Rawat, S., Kumar, D., Kumar, P., & Khattri, C. (2021). A systematic analysis using classification machine learning algorithms to understand why learners drop out of MOOCs. Neural Computing and Applications, 3. https://doi.org/10.1007/s00521-021-06122-3

Liliana, L., Santosa, P. I., & Kusumawardani, S. S. (2022). Completion factor in massive open online course in developing countries: A literature review in 2015-2021. *World Journal on Educational Technology: Current Issues*. *14*(2), 456-472. https://doi.org/10.18844/wjet.v14i2.6919

Raza, S. A., Umer, A., Qazi, W., & Makhdoom, M. (2017). The Effects of Attitudinal , Normative , and Control Beliefs on M-Learning Adoption Among the Students of Higher Education in Pakistan. Journal of Educational Computing Research, 56(4), 563–588. https://doi.org/10.1177/0735633117715941

Reparaz, C., Aznárez-Sanado, M., & Mendoza, G. (2020). Self-regulation of learning and MOOC retention. Computers in Human Behavior, 111(May). https://doi.org/10.1016/j.chb.2020.106423

Rodriguez, C. O. (2012). MOOCs and the AI-Stanford like Courses: Two Successful and Distinct Course Formats for Massive Open Online Courses. European Journal of Open, Distance and E-Learning, 167–170. https://doi.org/10.9783/9781512800036-008

Rõõm, M., Lepp, M., & Luik, P. (2021). Dropout time and learners' performance in computer programming MOOCs. Education Sciences, 11(10). https://doi.org/10.3390/educsci11100643

Ruipérez-Valiente, J. A., Halawa, S., Slama, R., & Reich, J. (2020a). Using multi-platform learning analytics to compare regional and global MOOC learning in the Arab world. Computers and Education, 146(December 2019), 103776. https://doi.org/10.1016/j.compedu.2019.103776

Ruipérez-Valiente, J. A., Halawa, S., Slama, R., & Reich, J. (2020b). Using multi-platform learning analytics to compare regional and global MOOC learning in the Arab world. Computers and Education, 146(November 2019). https://doi.org/10.1016/j.compedu.2019.103776

Sabah, N. M. (2016). Exploring students' awareness and perceptions: Influencing factors and individual differences driving m-learning adoption. Computers in Human Behavior, 65, 522–533. https://doi.org/10.1016/j.chb.2016.09.009

Shapiro, H. B., Lee, C. H., Wyman Roth, N. E., Li, K., Çetinkaya-Rundel, M., & Canelas, D. A. (2017). Understanding the massive open online course (MOOC) student experience: An examination of attitudes, motivations, and barriers. Computers and Education, 110, 35–50. https://doi.org/10.1016/j.compedu.2017.03.003

Shukor, N. A., & Abdullah, Z. (2019). Using learning analytics to improve MOOC instructional design. International Journal of Emerging Technologies in Learning, 14(24), 6–17. https://doi.org/10.3991/ijet.v14i24.12185

Stich, A. E., & Reeves, T. D. (2017). Massive open online courses and underserved students in the United States. Internet and Higher Education, 32, 58–71. https://doi.org/10.1016/j.iheduc.2016.09.001

Tarhini, A., Hone, K., & Liu, X. (2013). User Acceptance Towards Web-based Learning Systems : Investigating the Role of Social , Organizational and Individual factors in European Higher Education. Procedia Computer Science, 17, 189–197. https://doi.org/10.1016/j.procs.2013.05.026

Thompson, C., & Gregory, J. B. (2012). Managing Millennials: A Framework for Improving Attraction, Motivation, and Retention. Psychologist-Manager Journal, 15(4), 237–246. https://doi.org/10.1080/10887156.2012.730444

Tsai, Y. hsun, Lin, C. hung, Hong, J. chao, & Tai, K. hsin. (2018). The effects of metacognition on online learning interest and continuance to learn with MOOCs. Computers and Education, 121(June 2017), 18–29. https://doi.org/10.1016/j.compedu.2018.02.011

Van De Oudeweetering, K., & Agirdag, O. (2018). MOOCs as Accelerators of Social Mobility? A Systematic Review. Journal of Educational Technology & Society, 21(1), 1–11. https://doi.org/10.2307/26273863

Veletsianos, G., & Shepherdson, P. (2016). International Review of Research in Open and Distributed Learning A Systematic Analysis and Synthesis of the Empirical MOOC Literature Published in 2013 – 2015. International Review of Research in Open and Distributed Learning, 17(2), 1–16. https://doi.org/10.19173/irrodl.v17i2.2448

Liliana, L., Santosa, P. I., & Kusumawardani, S. S. (2022). Completion factor in massive open online course in developing countries: A literature review in 2015-2021. *World Journal on Educational Technology: Current Issues*. *14*(2), 456-472. https://doi.org/10.18844/wjet.v14i2.6919

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User Acceptance of Information Technology: Toward a Unified View. MIS Quarterly: Management Information Systems, 27(3), 425–478. https://doi.org/https://doi.org/10.2307/30036540

Wang, J., Antonenko, P., & Dawson, K. (2020). Does visual attention to the instructor in online video affect learning and learner perceptions? An eye-tracking analysis. Computers and Education, 146(December 2019), 103779. https://doi.org/10.1016/j.compedu.2019.103779

Watted, A., & Barak, M. (2018). Motivating factors of MOOC completers: Comparing between university-affiliated students and general participants. Internet and Higher Education, 37(June 2017), 11–20. https://doi.org/10.1016/j.iheduc.2017.12.001

Williams, K. M., Stafford, R. E., Corliss, S. B., & Reilly, E. D. (2018). Examining student characteristics, goals, and engagement in Massive Open Online Courses. Computers and Education, 126(February 2017), 433–442. https://doi.org/10.1016/j.compedu.2018.08.014

Witt, G. L., & Baird, D. . (2018). The Gen Z Frequency: How Brand Tune In and Build Credibility. Kogan Page Limited.

Wu, B., & Chen, X. (2017). Continuance intention to use MOOCs: Integrating the technology acceptance model (TAM) and task technology fit (TTF) model. Computers in Human Behavior, 67, 221–232. https://doi.org/10.1016/j.chb.2016.10.028

Yang, Q., & Lee, Y. C. (2021). The critical factors of student performance in MOOCs for sustainable education: A case of Chinese universities. Sustainability (Switzerland), 13(14). https://doi.org/10.3390/su13148089

Zhang, Jie. (2016). Can MOOCs be interesting to students? An experimental investigation from regulatory focus perspective. Computers and Education, 95, 340–351. https://doi.org/10.1016/j.compedu.2016.02.003

Zhang, Jingjing, Gao, M., & Zhang, J. (2021). The learning behaviours of dropouts in MOOCs: A collective attention network perspective. Computers and Education, 167(19), 104189. https://doi.org/10.1016/j.compedu.2021.104189

Zhang, Q., Bonafini, F. C., Lockee, B. B., Jablokow, K. W., & Hu, X. (2019). Exploring Demographics and Students' Motivation as Predictors of Completion of a Massive Open Online Course. International Review of Research in Open and Distance Learning, 20(2), 140–161. https://doi.org/10.19173/irrodl.v20i2.3730

Zhao, Y., Wang, A., & Sun, Y. (2020). Technological environment, virtual experience, and MOOC continuance: A stimulus–organism–response perspective. Computers and Education, 144(October 2019), 103721. https://doi.org/10.1016/j.compedu.2019.103721

Zhou, M. (2016). Chinese university students' acceptance of MOOCs: A self-determination perspective. Computers and Education, 92–93, 194–203. https://doi.org/10.1016/j.compedu.2015.10.012

Zhu, M., Sari, A., & Lee, M. M. (2018). A systematic review of research methods and topics of the empirical MOOC literature (2014–2016). Internet and Higher Education, 37(September 2017), 31–39. https://doi.org/10.1016/j.iheduc.2018.01.002