Data Article

Massive Open Online Courses (MOOCs): Data on higher education

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ABSTRACT

The data presented in this article are based on provides a systematic and organized review of 219 studies regarding using of Massive Open Online Courses (MOOCs) in higher education from 2012 to 2017. Consequently, the extant, peer-reviewed literature relating to MOOCs was methodically assessed, as a means of formulating a classification for MOOC-focused scholarly literature. The publication journal, country of origin, researchers, release data, theoretical approach, models, methodology and study participants were all factors used to assess and categorise the MOOC. These data contribute to materials required by readers who are interested in different aspects related to the literature of using Massive Open Online Courses (MOOCs) in higher education. Intention to use, interaction, engagement, motivations and satisfaction were five dynamics assessed in relation to the improvement of MOOCs. Students' academic performance can be influenced by MOOC which has the advantage of facilitating the learning process through offering materials and enabling the share of information.

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Specifications table

Subject area	Psychology
More specific subject area	Social science "online learning"
Type of data	Tables
How data were acquired	Systematic literature review
Data format	Analyzed
Experimental factors	Literature review
Experimental features	Systematic review, higher education
Data source location	Scopus, Web of Science, Science Direct, Springer, Emerald Fulltext, Taylor & Francis, Wiley InterScience, and Ingenta Journals. The Google Scholar search engine was also used to ensure the coverage of publications in other databases.
Data accessibility	Data are with this article
Related research article	M. S. Othman, G. Tashimaimaiti, L.M. Yusuf, W.M. Al-Rahmi, End-User Perspectives on Effectiveness of Learning Performance through Massive Open Online Course (MOOCs). In International Conference of Reliable Information and Communication Technology, Springer, Cham. 2017, 699–707 [17].

Value of the data

- Creates a deeper understanding of the research issues that have been addressed in information system (IS) and information technology (IT) literature on the MOOCs use.
- The data in this article provide more details on the theoretical frameworks/models/theories that have been employed in studies dedicated to the topic.
- The data in this article provide further understanding on the research methods that have been utilized.

1. Data

The data findings of the review are provided in this section. First, the answers to the above research questions are provided.

What are the research issues that have been addressed in IS/IT literature on the MOOCs use? Since 1992, when Davis develop a Motivational Model (MM) to using technology, as well as the Technology Acceptance Model (TAM) [1] and extended TAM [2], the Unified Theory of Acceptance and Use of Technology (UTAUT) [3], emphasised that with regard to a focus on IS and IT, the number of studies has consistently increased. From 2012 to 2017, 219 relevant papers were identified in the search. Resultantly, each of these papers was used for this study. Researcher, country of origin, publication journal and year of release were used to assess the papers. With regard to MOOCs and the adoption of IT or IS, proposals for how to undertake meticulous study were made through this specific assessment. The following sections explore this in greater depth.

1.1. Trends in the year of release

219 articles comprised the ultimate body of literature assessed in this study. Table 1 presents the number of published papers between 2012 and 2017. 41 were published in 2017, 76 were published in 2016, 49 were published in 2015, 14 were published in 2014, 18 were published in 2013 and 21 were published in 2012. Between 2012 and 2017, evidently the volume of literature focusing on the ongoing use of MOOCs continued to increase, as indicated by the data. Indeed, this subject continues to be a

Table 1
Distribution by the year of publication.

Year	Article count	Percentage	Year	Article count	Percentage	Year	Article count	Percentage
2017	41	18.7%	2015	49	22.4%	2013	18	8.2%
2016	76	34.7%	2014	14	6.4%	2012	21	9.6%

significant focus, with growing emphasis placed on the ongoing use of MOOCs as time has passed. Between 2016 and 2017, 53.4% (117) of the total papers assessed were released, evidencing this increase (see Table 1).

1.2. Distribution by journal

Table 2 shows the outcome results based on distribution of articles by the journal where authors published. The majority papers was published on ACM international conference proceeding series (3 papers), and social sciences Pakistan (2 papers). As well as other papers was published on 27 various journals (see Table 2). This result and analysis depends on the scope of the journals.

Table 2
Distribution by journal and conference.

Journal	No.	Journal	No.
British Journal of Educational Technology	34	Advanced Science Letters	4
International Review of Research in Open and Distance Learning	31	ARPN Journal Of Engineering And Applied Sciences	4
American Journal of Distance Education	19	Educause Review	4
Journal of Online Learning and Teaching	11	Man In India	4
Distance Education	9	Proceedings 2016 4th International Conference On User Science And Engineering I User	4
ACM International Conference Proceeding Series	8	International Education Studies	3
Social Sciences Pakistan	7	International Journal Of Information And Communication Technology Education	3
11th International Conference On Cognition And Exploratory Learning In Digital Age Celda	7	International Journal On Advanced Science Engineering And Information Technology	3
2013 IEEE Conference On E Learning E Management And E Services Ic3e 2013	6	International Review Of Research In Open And Distance Learning	3
2014 International Conference On IT Convergence And Security Icitcs	6	Journal Of Theoretical And Applied Information Technology	3
2014 International Conference On Web And Open Access To Learning Icwoal	6	Jurnal Teknologi	3
Advances In Education In Diverse Communities Research Policy And Praxis	5	Lecture Notes In Computer Science Including Subseries Lecture Notes In Artificial Intelligence And Lecture Notes In Bioinformatics	2
Australasian Journal Of Engineering Education	5	Proceedings Sims 2016 2nd International Conference On Systems Informatics Modelling And Simulation	2
Communications In Computer And Information Science	5	Proceedings Uksim Amss 2016 10th European Modelling Symposium On Computer Modelling And Simulation	1
Csedu 2015 7th International Conference On Computer Supported Education Proceedings	5	Technovation	1
Csedu 2017 Proceedings Of The 9th International Conference On Computer Supported Education	5	Turkish Online Journal Of Distance Education	1
Development And Learning In Organizations	4	International Conference On Research And Innovation In Information Systems (ICRIIS)	1

1.3. Distribution by the type

Table 3 shows that most of the studies were from articles papers with 118 percentages (53.9%), and the review papers with 54 percentages (24.7%). The next conference papers with 47 percentages (21.5%). Noted that high percentages of studies were conference papers and articles.

Table 3
Distribution by the type.

Document type	Documents	Percentage	Document type	Documents	Percentage
Articles	118	53.9%	Conference papers	47	21.5%
Review papers	54	24.7%	Total	219	100.00%

1.4. Distribution by subject area

Table 4 shows the distribution by the subject area we noted most of the studies was from computer science area 63 with percentages (28.8%), education area 42 with percentages (19.2%), and social sciences area 30 with percentages (13.7%). the next studies from arts and humanities area 19 with percentages (8.7%), also business, management and accounting area 19 with percentages (8.7%), and mathematics area 15 with percentages (6.8%). Moreover, agricultural and biological sciences, was 13 studies with percentages (5.9%), and engineering area 11 with percentages (5.0%), and finally environmental science area was 7 studies with percentages (3.2%).

Table 4
Distribution by subject area.

No	Subject area	Documents	Percentage
1	Computer science	63	28.8%
2	Education	42	19.2%
3	Social sciences	30	13.7%
4	Arts and humanities	19	8.7%
5	Business, management and accounting	19	8.7%
6	Mathematics	15	6.8%
7	Agricultural and biological sciences	13	5.9%
8	Engineering	11	5.0%
9	Environmental science	7	3.2%
Total		**219**	**100.0%**

1.5. Empirical research

Our analysis shows that most of the studies were from quantitative research by survey with 109 percentages (49.8%), and an interview was 48 percentages (21.9%). And finally, mixed methods approach with 62 percentages (28.3%). Thus, the total of quantitative research was a high level with 16 studies. Table 5 shows the results of our classification in empirical research.

Table 5
Specific empirical study strategies adopted to investigate willingness for ongoing adoption of IS.

Study strategy	Adopted research technique	Number of papers	Percentage
Quantitative research	Survey	109	49.8%
Qualitative research	Interviews	48	21.9%
Mixed methods	Survey, interviews	62	28.3%
Total		**219**	**100.0%**

2. Experimental design, materials and methods

Massive Open Online Courses (MOOCs) represent a very unique add to the learning environment. This is highlighted [4] who mentioned that these courses are the newest form of open educational resources advancement. (MOOCs) represent a very unique add to the learning environment. Massive Open Online Courses (MOOCs) have the advantage of being available for all and open to unlimited number of students.

In the language of numbers, confirmation of the ease of use and availability of MOOCs is provided by the fact of their use across 190 countries by 160,000 learners. According to [5], the success of MOOC is mainly determined by the interaction among participants facilitated by discussion forums. [6,7] highlighted this fact and added that interaction is determined by the knowledge of the learners on the first place. Massive Open Online Courses (MOOCs) are merely online courses for the purpose of education they are characterized by being accessible and scalable in the sense that anyone can access to them. They were first offered by the University of Manitoba in 2008 for the purpose of connective information [8]. In addition, the focus on social engagement extended to the small face-to-face groups that point towards a better influence on MOOCs in terms of completion [9–11]. Recently, research on MOOCs has shifted focus from learning to highlight the different factors related to attrition [12]. Social indication and discussion were proved not to be the biggest component of learners' experiences. However, work has concentrated on internal work of learners' experiences. The awareness of the limitation teaching resources have is the result of the much concentration on the smooth supply of efficient instructions as in Massive Open Online Courses (MOOCs).

2.1. Related work

A considerable volume of learners are able to participate in web-based study through MOOCs, which are one of their widely-accepted benefits. However, students' decisions and conduct are possible variables affecting performance through MOOCs, yet there is a dearth of study into such issues. The correlation of successful finishing rates to the level of learner engagement in web-based forums was assessed in [13]. The issue of using MOOCs in the modern world as an online educational facilitator is still controversial and somewhat vague [14]. The reason behind this interest is the growth in the use of learning management systems (LMSs) within educational institutions including universities. Through the data recorded within, these systems can be used to improve the performance of learners [15]. Moreover, social learning resource that opens up avenues for high education students to validate and carry out creative work, support peer alumni, and provide and acquire support from the school. In this regards, the factors examined in higher education are; faculty use [16]. Furthermore, continuous-time clickstream data produced by online learners who use online courses is another reason behind this growing interest [17].

2.2. Theoretical frameworks and reference theories

Readiness is a concept proved to be of a great importance educational environment and that was stated in change management theories. This is due to its successful implementation. Readiness for change on the one hand and readiness for Technology Enhanced Learning (TEL) are the two main types of Readiness. The former represented by the involvement possibility of organization members in change is described as a vital indictor to accept and support or refuse a change [18]. Expectation Confirmation Theory (ECT) is derived from marketing and it is related to the investigation of the current study. It has been developed by [19] and has been used heavily used by researchers since then in various field of knowledge such as sociology, social psychology, and public policy [20]. The theory uses the term 'Disconfirmation' in reference to the products' performance when it meets the expected level 'confirmation'. For MOOCs to be affective, certain components should be present mainly collaborative learning and communication through which students can learn and interact with others. A group of principles investigated and stated in chaos, network, and complexity and self-organization theories are combined together creating the theory of connectivism that forms that basis of MOOCs [21,22]. Satisfaction and intention to use were the dynamics emphasised in the technology

acceptance model (TAM), which was adopted for analysing MOOC improvement. The impact of MOOCs on learners' learning performance was evidenced by the findings. It has the advantage of facilitating the learning process through offering materials and enabling the share of information. In terms of generating knowledge and providing a wide variety of data, MOOCs in the light of technology acceptance model (TAM) is considered vital to learning activities. There are several theories used in information systems researches but in this study, only theories concerning technology adoption are examined. These include the Technology Acceptance Model (TAM) by [1,2], the Theory of Planned Behavior (TPB) by [23] and the Unified Theory of Acceptance and Use of Technology (UTAUT) by [3].

2.3. Research method

Marketing, service management and IT/IS are the three subject areas that are associated with the notion of on-going adoption of IT and IS. Additional databanks comprising articles that may have been overlooked were trawled using Google Scholar, in order to guarantee comprehensiveness. Additionally, further relevant papers were found by reading the bibliographies of the literature already collected. As a means of effectively searching the databases and identifying relevant literature, a number of processes were followed:

- Incorporation of unreleased working papers, Master's dissertations, doctoral theses, conference presentations and journal articles was made.

- Information systems and information technology search terms from the basis of using MOOCs were employed to search for the titles and abstracts of books and papers.
- Setting of the research parameters and search words was engaged in. 'MOOC' and 'Massive Open Online Course', as well as their plural forms, were the two basis search terms adopted.

Secondly, following the approach of [24,25] and as Table 6 shows, an initial search of the distance learning and educational technology field was made to identify several relevant journals. The Journal of Online Learning and Teaching, American Journal of Distance Education, International Review of Research in Open and Distance Learning, as well as the British Journal of Education Technology were all identified. One journal appeared to include a limited number of relevant articles, however they were ultimately excluded from the systematic appraisal as they were inappropriate. This phenomenon potentially occurred due to single words within the terms being searched by the software, despite inverted commas being included to make the search terms complete phrases.

As a third stage, numerous academic databases were subsequently searched using the key terms. As Table 7 shows, this included IEEEXplorer, ProQuest (ERIC, British Education Index and Australian Education Index, JSTOR's education journals, Scopus and ISI Web of Knowledge. The MOOC acronym did produce articles relating to certain fields such as 'Management of Organisational Change', as well as 'Multiple Optical Orthogonal Code Sequences', which were evidently irrelevant to the research.

Table 6
Identified academic journals and search outcomes.

Title of journal	Number of results	Date
British Journal of Educational Technology	34	13/04/2018
International Review of Research in Open and Distance Learning	31	13/04/2018
American Journal of Distance Education	19	15/04/2018
Journal of Online Learning and Teaching	11	15/04/2018

Table 7
Search Results- Selected Academic Databases.

Databases	Search results	Date
ISI web of knowledge	43	12/04/2018
Scopus	108	12/04/2018
JSTOR (education titles)	39	13/04/2018
ProQuest	19	13/04/2018
IEEE Explorer	10	13/04/2018

Additionally, further analysis is required of questions relating to the ethical use of MOOC learners' information, programmes' cultural conflicts, as well as other thought-provoking study topics.

Acknowledgments

Transparency document. Supporting information

Transparency document associated with this article can be found in the online version at https://doi.org/10.1016/j.dib.2018.11.139.

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