International Review of Research in Open and Distributed Learning

The Landscape of MOOC Platforms Worldwide

Maria Perifanou and Anastasios A. Economides

Volume 23, Number 3, September 2022

URI: https://id.erudit.org/iderudit/1092435ar
DOI: https://doi.org/10.19173/irrodl.v23i3.6294

See table of contents

Publisher(s)

Athabasca University Press (AU Press)

ISSN

1492-3831 (digital)

Explore this journal

Cite this article

Perifanou, M. & Economides, A. (2022). The Landscape of MOOC Platforms Worldwide. *International Review of Research in Open and Distributed Learning*, *23*(3), 104–133. https://doi.org/10.19173/irrodl.v23i3.6294

Article abstract

Previous studies have mainly investigated major massive open online course (MOOC) platforms such as Coursera, edX, and Udemy. This study used 21 metrics to explore 35 MOOC platforms from across the world. Five Web analytics tools were used to analyze these MOOC platforms using data from MOOC platform directories and exploration of platform sites. The findings revealed that many universities, companies, and organizations have cooperated with the platforms and provided MOOCs through them. Major global platforms have offered thousands of MOOCs while regional platforms were more likely to have offered dozens. Some large platforms had millions of registered users while others registered just thousands. The major global platforms were established in the US to offer MOOCs mainly in English, though they offered MOOCs in other languages as well. The regional platforms offered MOOCs mainly in local languages, and to some extent in English and other languages. Some platforms engaged users for long periods while others failed to keep users after they viewed the first page of the platform. On average, a visitor stayed on a platform for 8 minutes visited 7.2 pages per visit. Major global platforms attracted users from all over the world, while regional platforms mainly attracted users from countries where the regional platform language was spoken. Some platforms had very few accessibility and contrast errors while other platforms performed poorly. Most platforms were mobile-friendly. However, administrators of almost all MOOC platforms should take actions to increase the speed of their platform. Other recommendations include undertaking marketing campaigns to increase the number of partners, the number of MOOCs offered, and the platforms' visibility.

International **R**eview of **R**esearch in **O**pen and **D**istributed **L**earning
Volume 23, Number 3

September – 2022

The Landscape of MOOC Platforms Worldwide

Maria Perifanou and Anastasios A. Economides
University of Macedonia

Abstract

Previous studies have mainly investigated major massive open online course (MOOC) platforms such as Coursera, edX, and Udemy. This study used 21 metrics to explore 35 MOOC platforms from across the world. Five Web analytics tools were used to analyze these MOOC platforms using data from MOOC platform directories and exploration of platform sites. The findings revealed that many universities, companies, and organizations have cooperated with the platforms and provided MOOCs through them. Major global platforms have offered thousands of MOOCs while regional platforms were more likely to have offered dozens. Some large platforms had millions of registered users while others registered just thousands. The major global platforms were established in the US to offer MOOCs mainly in English, though they offered MOOCs in other languages as well. The regional platforms offered MOOCs mainly in local languages, and to some extent in English and other languages. Some platforms engaged users for long periods while others failed to keep users after they viewed the first page of the platform. On average, a visitor stayed on a platform for 8 minutes visited 7.2 pages per visit. Major global platforms attracted users from all over the world, while regional platforms mainly attracted users from countries where the regional platform language was spoken. Some platforms had very few accessibility and contrast errors while other platforms performed poorly. Most platforms were mobile-friendly. However, administrators of almost all MOOC platforms should take actions to increase the speed of their platform. Other recommendations include undertaking marketing campaigns to increase the number of partners, the number of MOOCs offered, and the platforms' visibility.

Keywords: Massive open online course, MOOC, MOOC platform, open education, users' engagement

Introduction

The aims of many international organizations include a focus on open education for everyone. For example, the United Nations' Universal Declaration of Human Rights (United Nations, 1948) specifically cited the right of free education for everyone. Similarly, the European Commission (2016) in their agenda on open education included aims for open access and participation in education for everyone.

Massive open online courses (MOOCs) have been proposed as a tool to achieve open education for all without restrictions of time and location (Siemens, 2013). In MOOCs, massive means that a huge number of learners can access, attend, and participate. The term open means that anyone can freely access, attend, and participate in a MOOC without any restrictions (e.g., prior educational qualification, time, place). Access to, attendance at, and participation in a MOOC all happen online. Finally, describing a MOOC as a course means that it is structured into several modules and provided within a specific time frame. It may contain video lectures, educational material, assignments, self-assessment tests, quizzes, and online discussion forums. The duration of a MOOC may vary from a few hours to months. Certification can be issued for a fee after the learner has successfully passed a final exam.

There are two main categories of MOOCs—xMOOCs where the teacher delivers instruction, perhaps through video presentations and quizzes, and cMOOCs or connectivist MOOCs that emphasize knowledge creation, autonomy, collaboration, and social networking (Siemens, 2013). However, there are also several variations of these two main categories (Economides & Perifanou, 2018a; Clark, 2013; Hidalgo & Abril, 2020; Liyanagunawardena et al., 2019; Pilli & Admiraal, 2016). MOOCs are offered stand-alone on a website or together with other MOOCs in one or more MOOC platforms (Zawacki-Richter et al., 2018). A MOOC platform is an environment shared by a very large number of MOOC learners, creators, and teachers as well as providers, universities, organizations, and companies. It hosts and runs MOOCs that have been created by MOOC providers. It also offers participants tools and services such as searching, cataloguing, management, creation, hosting, sharing, and evaluation. Popular MOOC platforms include Coursera, edX, FutureLearn, Swayam, Udacity, Udemy, and so on. A MOOC provider may be a university, organization, company, or individual (e.g., instructor) that provides one or more MOOCs to learners via either private or shared platforms. Major MOOC providers include Google Cloud, Harvard University, IBM, Microsoft, MIT, Stanford University, University of California, University of Michigan, University of Pennsylvania, and others. A MOOC aggregator or directory contains a list, directory, or database of MOOC metadata and links to MOOCs. It may simply list the names of MOOCs and links to them. MOOC aggregators include Class Central, MOOC-list, CourseTalk, and MyEducationPath. Similarly, a MOOC platform aggregator or directory contains a list, directory, or database of metadata related to MOOC platforms and links to these platforms. It may simply list the names of MOOC platforms and their links.

After the first excitement about MOOCs in 2012, the COVID-19 pandemic brought MOOCs once again to the forefront (Mays et al., 2021; Purkayastha & Sinha, 2021; Salas-Rueda et al., 2022). During the pandemic, there was increased interest in MOOCs due to the quarantine measures applied in many countries. Learners wanted to access open educational material via the Internet, from any place and at any time. The number of learners registered on a MOOC platform in 2020 corresponded to one-third of all learners ever registered on such platforms (Shah, 2020). More specifically, between 2012 and 2020 (and excluding China), the number of learners increased from 2 million to 180 million. The number of courses

increased from 250 in 2012 to 16,300 in 2020, and over the same period, the number of university partners in MOOC platforms increased from 40 to 950 (Shah, 2020).

In addition, there has been an increase in the number of publications on MOOCs (Alemayehu & Chen, 2021; Hidalgo & Abril, 2020). Most previous studies on MOOCs investigated learners' motivation (e.g., Hakami et al., 2017; Zhu et al., 2018), behaviour (e.g., Ferguson & Clow, 2015), and drop-out rates (e.g., Alario-Hoyos et al., 2014; Jordan, 2014). Several studies investigated characteristics of MOOC quality (e.g., Economides & Perifanou, 2018a; Gamage et al., 2015; Margaryan et al., 2015; Oh et al., 2020; Shanshan & Wenfei, 2022; Singh, 2022; Yousef et al., 2015), and the limited openness of course materials (e.g., Li et al., 2014).

However, there have been few studies investigating MOOC platforms (see Table 1), and most of these studied the few well-known MOOC platforms (e.g., Coursera, edX, Udemy, Udacity). Ayoub et al. (2020) suggested extending the investigation of platforms beyond the few well-known ones. Furthermore, a systematic literature review (Hakami et al., 2017) found that most MOOC-related studies focused only on few geographic regions. Researchers such as Li et al. (2014) and Ruipérez-Valiente et al. (2020) recommended the investigation of not only global MOOC platforms (e.g., Coursera, edX) but also MOOC platforms from different regions. Therefore, this study investigated the current state of 35 global and regional MOOC platforms from around the world.

Table 1

Previous Studies Evaluating MOOC Platforms

Study	MOOC platform	Evaluation criteria	Results
Agrawal et al. (2015)	Coursera, edX, NPTEL	Openness of content and technology, use of multimedia and social media, language support, certificate courses, responsive Web design, mobile apps, catalogue diversity	Coursera excels on most criteria except for openness
Alkaff et al. (2018)	Coursera, edX, Udacity, Udemy, FutureLearn, GetSmarter, ASU Online, 2u	Services offered to learners, instructors, universities, companies/organizations, certifiers	No platform offers services to all five types of customers Only Udacity offers certifiers the ability to create courses for technical certification and to provide technical certification exams. It offers learners technical certificates and job placement, and companies/organizations the ability to hire employees Only Udemy offers instructors the ability to create courses.
Antonova & Bontchev (2020)	Coursera, edX, Udacity, FutureLearn, Swayam, LinkedIn	Number of learners, courses, and degrees Number of mobile courses, installs, and reviews on Google Play	Coursera excels followed by edX Udemy excels on mobile installs and reviews on Google Play

Study	MOOC platform	Evaluation criteria	Results
	learning, Khan Academy		
Ayoub et al. (2020)	Coursera	Number of partner institutes, courses and instructors	United States is the top contributor followed by China.
Brahimi & Sarirete (2015)	Coursera, edX, Open2Study, FutureLearn, Udacity, FUN, Rwaq, Iversity, Edraak	Number of courses	Coursera offers the most courses (65%) followed by edX (18.3%), Open2Study (4.9%), FutureLearn (4.5%), Udacity (3.8%), FUN (3.8%), Rwaq (3.4%), Iversity (3.1%), Edraak (1%).
Cisel (2019)	Canvas Network, Coursera, edX, FUN, Futurelearn, Iversity, MiriadaX	Number of courses and partner institutes in MOOC List and Class Central Language, topic, duration, weekly workload or courses	Platforms mainly partner with institutes from their own country Institutes that offer courses in major platforms follow an industrial approach to course creation Course workload higher for courses on major platforms Course duration and workload decreased to reduce dropout rate
Conache et al., (2016)	Coursera, Udemy, Udacity, EdX	Type of MOOC, platform rank and speed, number of visits to platform, visit duration, number of pages viewed by visitors	All platforms offer both free and paid courses and, usually, paid certificates Coursera and Udemy ranked high rank and have around 40 million visits No platforms achieve good speeds for mobile access On average, visitors stay around 33 minutes and view 6.3 pages
Cornejo-Velazquez et al. (2020)	edX, Coursera, Udacity, Udemy, Codecademy	Customer segment, value proposition, communication channels, customer relationships, revenue streams, key activities, key resources, key partners, cost structure	Coursera and edX provide academic MOOCs Udacity and Udemy provide job-oriented MOOCs edX allows only universities to offer MOOCs Udemy allows anyone to offer MOOCs
Costa et al. (2018)	Coursera, edX	Number of universities offering courses, number of courses and instructors, areas of knowledge, workload, and duration of courses	Increase in the number of MOOCs and the number of universities offering MOOCs edX provides a larger variety of MOOC subjects than Coursera In general, a course is taught by two instructors for nine weeks, workload five hours per week

Study	MOOC platform	Evaluation criteria	Results
Funieru & Lazaroiu (2016)	Coursera, edX	Technical (certification verification, evaluation methods, infrastructure, integration) User perspective (structure and content, communication tools, multimedia resources, financial accessibility)	edX excels in quality of educational materials, multimedia, assessment methods, and openness
Gamage et al. (2020)	Coursera, EdX, Future Learn, OpenSAP, Open Learning, Iversity	Collaboration and interactions (learner-learner, learner-instructor, learner-platform, learner-content)	Coursera, edX, Future Learn, and Iversity offer limited collaborative opportunities The forum is the only collaboration space in the platform designs
Goglio & Nascimbeni (2021)	Italian university platforms, Coursera, OpenupEd, EduOpen, Federica, FutureLearn	Openness (language, registration, time accessibility, disability, license, download)	Most Italian MOOC providers offer course content with open licenses and do not restrict access to registered users
Li et al. (2014)	23 MOOC platforms	Licensing, support for mobile environment, course languages, accreditation	Most platforms provide courses in various subjects at the tertiary level only Most platforms reserve the rights of educational materials One-third of platforms support mobile access Different platforms provide courses in different languages Only four platforms provide personal support to users
Lin et al. (2015)	17 MOOC platforms	General (e.g., country, released date, free to register/learn/teach) Technology (mobile app, responsiveness, learning analytics) Business (for profit/non-profit, partnership model, number of university partners) Course (maximum class size, number of courses, width of courses, temporal/self-paced/mixed, course features)	FutureLearn, iversity, NovoED, and Canvas Network are the best platforms According to a survey, users prefer Futurelearn and iversity
Maldonado-Mahauad et al. (2021)	Ecuadorian university platforms based on Open edX and Moodle; Coursera, edX, MiriadaX	Number of courses offered by various Ecuadorian universities, course subject, workload, duration	Most Ecuadorian MOOCs related to applied, social, and natural sciences; humanities covered least Open edX and Moodle the most widely used On average, a student needs to spend eight hours per week Course duration four to eight weeks

Study	MOOC platform	Evaluation criteria	Results
Ruipérez-Valiente et al., (2020)	edX, Edraak	Learner characteristics	Edraak attracts local and younger learners, more females and those with lower levels of education Edraak courses suit local learners' interests and learning needs Learners in Edraak courses more engaged than those in local edX-licensed courses
Zancanaro et al. (2017)	Open Learning, CourseSites, P2PU, Versal, Udemy, Eliademy	Accreditation, accessibility, usability, security, cost information, copyright information, interaction/collaboration, report submission, content management, activity/tests, course schedule, participant management, gamification, connection with social networks, course visibility	Almost all platforms meet all criteria Open Learning and Eliademy meet most requirements.

Table 1 illustrates that most previous studies examined well-known MOOC platforms (e.g., Coursera, edX) with respect to (a) number of courses, partner institutes, learners, and course subjects (e.g., Costa et al., 2018; Maldonado-Mahauad et al., 2021); (b) languages (e.g., Cisel, 2019; Conache et al., 2016; Goglio & Nascimbeni, 2021; Li et al., 2014); (c) course duration and workload (e.g., Antonova & Bontchev, 2020; Ayoub et al., 2020; Brahimi & Sarirete, 2015; Cisel, 2019). Other previous studies examined well-known MOOC platforms regarding their (a) business models (e.g., Cornejo-Velazquez et al., 2020; Lin et al., 2015); (b) openness (e.g., Agrawal et al., 2015; Conache et al., 2016; Funieru & Lazaroiu, 2016; Goglio & Nascimbeni, 2021); and (c) mobile access (e.g., Agrawal et al., 2015; Antonova & Bontchev, 2020; Li et al., 2014; Lin et al., 2015). In addition, Conache et al. (2016) investigated four well-known MOOC platforms to determine their (a) rank, (b) speed, (c) number of visits, (d) visit duration, (e) number of pages viewed per visitor.

However, no previous study has examined other parameters of MOOC platforms such as the (a) distribution of visits from main countries of origin, (b) distribution of visits by originating source, (c) number of Websites pointing to it, (d) number of links pointing to it, (e) age of links' (f) bounce rate, and (g) accessibility. Thus, this study analyzed 35 MOOC platforms using 21 parameters (including new and previously proposed parameters). It depicted the profiles of these MOOC platforms, their popularity, and their users' engagement.

The next section presents the methodology for this study, followed by the results. Conclusions and recommendations are also provided.

Methodology

This study took place from summer to autumn, in 2021. A five-stage methodology was followed: (a) identify

major MOOC platforms around the world, (b) identify methods and tools to evaluate these MOOC platforms, (c) identify evaluation parameters and their corresponding metrics, (d) measure and record the metrics for each platform, and (e) analyze the measurements.

To begin, we located 35 major MOOC platforms as catalogued by Class Central (Shah et al., 2021). Class Central aggregates, lists, and reviews courses from many providers so learners can find appropriate courses to meet their educational objectives. The final list included major global and regional MOOC platforms from around the world. We then defined the methods and tools for evaluating these 35 MOOC platforms. Initially, we explored these platforms on Class Central. Then we collected information curated by MOOC-list, CourseTalk, and MyEducationPath.

Next, we thoroughly explored each of these platforms by visiting their Websites. We recorded the platform's (a) hosting country, (b) launch year, (c) number of registered users, (d) number of partner institutes, (e) number of MOOCs offered, and (f) the most common languages and subjects of their offered MOOCs. In cases where the platform content was in languages we did not speak, we used automatic translation tools. However, several parts of these platforms could not be translated automatically. In addition, each platform followed a different structure and provided different information regarding its content. Since it was not feasible to depend only on information found on their Websites, we resorted to five Web analytics tools in order to achieve a uniform and comparable evaluation of these platforms: SimilarWeb, OpenLinkProfiler, Google PageSpeed Insights, Google Mobile-Friendly, and WAVE.

- Using SimilarWeb, we measured each platform's (a) global rank; (b) rank in education; (c) number of visits during last six months; (d) distribution (percentages) of visits from main countries of origin; (e) distribution (percentages) of visits by direct, referral, search, and social media; (f) average visit duration; (g) average number of pages per visit; and (h) bounce rate.

- Using Google PageSpeed Insights, we measured each platform's speed.

- Using Google Mobile-Friendly, we measured each platform's mobile-friendliness.

- Using WAVE, we measured each platform's accessibility errors, contrast errors, and accessibility alerts.

- Using OpenLinkProfiler, for each platform we measured (a) the number of Websites pointing to it; (b) the distribution (percentages) of Websites pointing to it by country; (c) the number of links pointing to it; and (d) the age of these links.

Table 2 summarizes the evaluation parameters and metrics that framed the data collection for this study.

Table 2

Evaluation Parameters and Metrics for Measuring MOOC Platforms

MOOC platform parameter	MOOC platform metric (data source or tool)
Demographics	Host country Launch year MOOC languages MOOC subjects
Size	Number of MOOCs (on site, Class Central, CourseTalk, MyEducationPath) Number of partner institutions (on site)
Popularity	Global rank (SimilarWeb) Education rank (SimilarWeb) Number of registered users (on site, Class Central) Number of visits during last six months (SimilarWeb) Distribution of visits from main countries (SimilarWeb) Distribution of visits by originating source (SimilarWeb) Number of Websites pointing to it (OpenLinkProfiler) Distribution of Websites by main countries pointing to it (OpenLinkProfiler) Number of links pointing to it (OpenLinkProfiler) Age of links (OpenLinkProfiler)
Visitor engagement	Average visit duration (SimilarWeb) Average number of pages per visit (SimilarWeb) Bounce rate (SimilarWeb).
Technical characteristics	Speed (Google PageSpeedInsights) Mobile-friendliness (Google Mobile-Friendly) Accessibility, such as errors or alerts (WAVE).

The names of most metrics were self-explanatory. The metric labelled distribution (percentages) of visits by direct, referral, search, and social media corresponded to the percentages of visitors that came to the platform directly, or after visiting another Website that pointed to the platform, after using a search engine, or after visiting social media. The metric bounce rate corresponded to the percentage of visitors who left the Website after viewing just one page. Regarding platform speed, 0 to 50 was a poor score, 50 to 90 was a medium score, and 90 to 100 was a good score. The age of links metric described the distribution (percentages) of the number of new links pointing to the platform during each of the years 2016, 2017, 2018, 2019, 2020, and 2021.

Table 2 shows how we allocated the 21 metrics to each one of five main platform parameters: (a) demographics, (b) size, (c) popularity, (d) visitor engagement, and (e) technical characteristics.

- Demographics included the platform's host country, launch year, as well as the languages and subjects of its MOOCs.

- Platform size was determined by the number of MOOCs the platform offered and its number of partner institutions.
- Popularity was measured by the platform's (a) global rank, (b) education rank, (c) number of registered users, (d) number of visits, (e) distribution of visits from main countries, (f) distribution of visits by originating source, (g) number of Websites pointing to it, (h) number of links pointing to it, and (i) age of links.
- Visitor engagement was measured by the average duration of platform visits, average number of pages per visit, and bounce rate.
- A platform's technical characteristics were measured by its speed, mobile-friendliness, and accessibility.

In the final stage we measured the 21 metrics defined above. The next section presents the analysis of these findings.

Results and Discussion

Platform Demographics

The list of 35 platforms was international in scope (Shah et al., 2021). Platforms have been developed in many countries all over the world. Although the major platforms (e.g., Coursera, edX, Udacity, Udemy) are located in US, other large platforms are located in China (XuetangX), India (Swayam), UK (FutureLearn), and Spain (MiriadaX). Table 3 summarizes the data on platform demographics and size.

Table 3

MOOC Platforms: Demographics and Size

Platform	Host country	Launch year	Main language	No. of MOOCs shown at				No. of univ. partners + others
				Platform itself	Class Central	Course Talk	My Education Path	
Canvas Network	US	2012	English, other	?	607	321	470	?
CNMOOC	China	2014	Chinese, English	2,531	2,000	?	?	?
Coursera	US	2012	Multiple	?	7,870	2,890	1,120	150 + 50
Edraak	Jordan	2013–2014	Arabic	185	36	53	?	?
EduOpen	Italy	2016	Italian, English	342	67	?	?	20 + 6
edX	US	2012	English, other	3,523	4,687	2,065	1,720	160

Platform	Host country	Launch year	Main language	No. of MOOCs shown at				No. of univ. partners + others
				Platform itself	Class Central	Course Talk	My Education Path	
EMMA	EU Project	2015	Various European	?	66	55	?	33 + 11
eWant *	Taiwan	2013	Chinese	2,460	1,900	?	?	93
Federica Web Learning	Italy	2015	Italian, English, other	300	86	?	?	21
Fisdom	Japan	2016	Japanese	?	20	?	?	?
Fun-MOOC	France	2013	French, English, German	711	675	98	?	140
FutureLearn	UK	2012–2013	English, other	1,285	2,436	83	83	91 + 111
Gacco	Japan	2014	Japanese	?	95	1	?	?
JMOOC	Japan	2013	Japanese	430	?	?	?	95
iCourse163	China	2014	Chinese	?	9,228	?	?	785
IndonesiaX	Indonesia	2015	Indonesian	?	40	?	?	22
Iversity	Germany	2013	German, English, other	239	115	27	108	?
Kadenze	US	2015	English	?	164	92	88	33 + 21
K-MOOC	Korea	2015	Korean, English	1,374	858	?	?	140
MexicoX *	Mexico	2015	Spanish, English	100	13	?	?	40
MiriadaX	Spain	2013	Spanish, Portuguese, English, other	?	687	301	?	100
Open Education Taiwan	Taiwan	2015	Chinese	647	531	?	?	63
Openedu.ru	Russia	2015	Russian	759	650	?	?	?
OpenHPI	Germany	2012	German, English	?	77	60	2	?
Open Learning Japan	Japan	2014	Japanese	?	?	?	?	?
Open Universities Australia	Australia	2013	English, other	2,530	109	?	?	25

Platform	Host country	Launch year	Main language	No. of MOOCs shown at				No. of univ. partners + others
				Platform itself	Class Central	Course Talk	My Education Path	
Prometheus	Ukraine	2014	Ukrainian	200	120	?	?	?
Rwaq (Riwaq or Rewaq)	Saudi Arabia	2013	Arabic	685	85	?	?	?
Swayam	India	2017	English, Hindi	?	2,065	?	?	135
ThaiMOOC	Thailand	2017	Thai, English	527	229	?	?	87
Udacity	US	2012	English	500	330	210	197	?
Udemy	US	2010	English, other	155,000	157,000	50,497	9,812	?
XuetangX *	China	2013	Chinese	4,608	3,500	?	?	641
Xue Yin Online	China	2017	Chinese	?	6,000	?	?	?
Zhihuishu	China	2012–2013	Chinese	?	8,330	?	?	?

Note. A question mark means that data were not available. * Indicates there were connection problems in reviewing the platform.

The number of platforms increased rapidly starting in 2012, the year of the MOOCs, and numbers continued to grow for the next three years (2013–2015). In 2017, two large MOOC platforms, Swayam (India) and Xue Yin Online (China), came on the scene.

Table 3 shows that while most global platforms offered MOOCs mainly in English, they have started offering MOOCs in other languages too. For example, Coursera (a major global platform) offered 2,334 courses in English and a large number of MOOCs in other languages, including Spanish (1,064), Russian (1,005), French (948), Portuguese (869), Arabic (801), German (755), Vietnamese (755), and Italian (729). On the other hand, most local platforms offered MOOCs mainly in their local language, though many also offer MOOCs in English. For example, the French regional platform Fun-MOOC offered MOOCs in French (589), English (69), Spanish (5), Arabic (1), Japanese (1), and Simplified Chinese (1).

Most platforms covered a large variety of subjects mainly addressing adults' learning needs (e.g., higher education students, continuing education professionals). Most platforms mainly offered information and communication technologies (ICT) MOOCs followed by technical and professional development topics. For example, Coursera offered MOOCs in the following subjects (number of MOOCs): computer science (1,018), data science (667), information technology (265), language learning (248), business (151), physical science and engineering (85), social sciences (68), arts and humanities (63), and health (54). A few platforms exclusively offered ICT MOOCs (e.g., OpenHPI).

Platform Size

Thousands of MOOCs were offered by the major global platforms (Coursera, 7,500; edX, 4,000; Udemy,

150,000), Chinese platforms (CNMOOC, 2,500; iCourse, 9,000; XuetangX, 3,500; Xue Yin Online, 6,000; Zhihuishu, 8,300), as well as Indian Swayam (2,000), Taiwanese eWant (1,900), UK FutureLearn (1,500), and Korean K-MOOC (1,000). Almost all platforms have created partnerships with universities, businesses, and organizations that offer their MOOCs through the platforms. The Chinese iCourse and XuetangX have the largest number of partners, with 785 and 641, respectively. A number of platforms have over 100 partners: Coursera (200), edX (160), FunMOOC (140), FutureLearn (200), K-MOOC (140), MiriadaX (100), and Swayam (135).

Platform Popularity

Table 4 summarizes the data on the popularity of MOOC platforms. In general, platforms did not succeed in achieving high rank scores among all Websites worldwide. According to SimilarWeb, only Udemy (314) and Coursera (611) managed to be among the top 1,000 websites. However, several platforms were among the top 100 educational Websites worldwide: Coursera (26), Edraak (25), FunMOOC (81), FutureLearn (9), iCourse 163 (11), K-MOOC (65), Openedu.ru (88), Prometheus (47), Rwaq (75), Swayam (97), ThaiMOOC (28), and Udemy (16).

Table 4

MOOC Platforms' Popularity: SimilarWeb Rankings and Data on Visitors and Visits

MOOC platform	Global rank	Education rank	Registered users	No. of visits	Distribution of visits by main country (%)	Distribution of visits (%)			
						Direct	Referral	Search	Social
Canvas Network	44,267	403	?	1.35 million	US (76) Philippines (3) Mexico (2) UK (2) Australia (2)	18	1	80	1
CNMOOC					?				
Coursera	611	26	87 million	51.62 million	US (21) India (10) Mexico (4) Canada (3) UK (3)	59	4	25	6
Edraak	29,664	25	4 million	1.47 million	Saudi Arabia (26) Egypt (21) Alheria (10) Morocco (10) Jordan (6)	48	3	35	12
EduOpen	?		105,000			?			
edX	2,691	102	35 million	16.29 million	US (18) India (7) Mexico (5) Australia (4) Brazil (4)	56	7	24	6

MOOC platform	Global rank	Education rank	Registered users	No. of visits	Distribution of visits by main country (%)	Distribution of visits (%)			
						Direct	Referral	Search	Social
EMMA					?				
eWant *	177,621	110	20,000	145,000	Taiwan (93) China (2) Malaysia (2) Hong Kong (2) US (1)	59	6	28	3
Federica Web Learning	149,307	115	20,000	177,000	Italy (85) Iran (9) Germany (2) Brazil (2) Spain (1)	58	12	22	3
Fisdom					?				
Fun-MOOC	54,574	81	2 million	751,000	France (61) Morocco (4) Peru (3) Belgium (3) Cameroon (3)	74	1	17	3
FutureLearn	8,100	9	15 million	5.89 million	UK (24) US (7) India (5) Australia (5) Vietnam (3)	40	7	41	7
Gacco	746,258	343	850,000	< 50,000	Taiwan (95) China (2) Hong Kong (1) US (1)	35	20	41	3
JMOOC	?		250K			?			
iCourse163	12,310	11	?	3.59 million	China (94) Hong Kong (1) US (1)	69	4	25	1
IndonesiaX					?				
Iversity	574,719	1,877	1 million	61,000	Germany (21) Spain (10) Brazil (7) Egypt (6) China (5)	56	7	33	3
Kadenze	152,943	?	?	185K	?		?		
K-MOOC	99,587	65	1.6 million	350,000	Korea (95) Thailand (2) US (1)	59	2	37	2

MOOC platform	Global rank	Education rank	Registered users	No. of visits	Distribution of visits by main country (%)	Distribution of visits (%)			
						Direct	Referral	Search	Social
MexicoX *	80,814	156	2.5 million	523,000	Mexico (98) Costa Rica, Colombia, Ecuador, Peru (< 1)	66	3	23	5
MiriadaX	164,800	241	6 million	222,000	Spain (28) Mexico (17) Peru (11) Colombia (11) Argentina (7)	61	8	25	3
Open Education Taiwan					?				
Openedu.ru	74,272	88	1.8 million	596,000	Russia (84) Ukraine (5) Belarus (3) Turkey (2) Kazakhstan (2)	55	6	20	11
OpenHPI	?	?	?	94,000	Germany (65) Switzerland (10) Netherlands (3) Austria (2) US (2)	54	16	22	5
Open Learning Japan					?				
Open Universities Australia	103,122	?	463,000	411,000	Australia (86) Vietnam (1) US (1) Brazil (1)		?		
Prometheus	132,798	47	1.5 million	323,000	Ukraine (95) Poland (2) Germany, Czech Republic (< 1)	46	4	30	10
Rwaq (Riwaq or Rewaq)	149,863	75	1 million	244,000	Saudi Arabia (41) Egypt (14) Morocco (5)	45	4	41	9

MOOC platform	Global rank	Education rank	Registered users	No. of visits	Distribution of visits by main country (%)	Distribution of visits (%)			
						Direct	Referral	Search	Social
					Turkey (4) Algeria (4)				
Swayam	25,266	97	16 million	2.79 million	India (97) Ghana, Qatar, US, UAE (< 1)	36	15	21	1
ThaiMOOC	81,380	28	200,000	362,000	Thailand (99)	41	6	27	25
Udacity	8,017	272	14 million	5.82 million	Egypt (19) US (16) Saudi Arabia (10) India (10) Nigeria (3)	62	6	22	7
Udemy	314	16	40 million	110.27 million	US (16) India (15) Brazil (6) Mexico (7) Turkey (4)	61	3	22	7
XuetangX *	83,441	271	60 million	456,000	China (91) US (2) Hong Kong (2)	71	5	22	1
Xue Yin Online	228,571	878	?	119,000	China (97) US, Taiwan, Hong Kong, India (< 1)	76	16	8	0
Zhihuishu	63,174	191	10 million	681,000	China (98) Hong Kong, Taiwan, S. Korea, US (< 1)	71	2	26	1

Note. A question mark means that data were not available. * Indicates there were connection problems in reviewing the platform.

Data about the number of registered users were missing from many platforms and could not be found on the platforms themselves, on Class Central, or other platform directories (e.g., CourseTalk, MOOC-list, MyEducationPath). The four major US-based platforms had the most registered users worldwide, namely Coursera (87 million), edX (35 million), Udacity (16 million), and Udemy (40 million). In fact, these four platforms have managed to more than double their registered users since 2017 (Shah, 2018). However, the advent of Chinese platforms XuetangX (60 million) and Zhihuishu (10 million) have upset the status quo. In addition, India's Swayam (16 million) and UK's FutureLearn (15 million) have become serious competitors. Other platforms with over a million registered users include Spain's MiriadaX (6 million), Jordan's Edraak (4 million), MexicoX (2.5 million), France's FunMOOC (2 million), Russia's Openedu.ru (1.8 million), Korea's K-MOOC (1.6 million), Ukraine's Prometheus (1.5 million), Saudi Arabia's Rwaq (1

million), and Germany's Iversity (1 million).

Table 4 shows that the major global platforms clearly attracted the largest numbers of visitors during the last six months: Coursera (51.62 million), edX (16.29 million), and Udemy (110.27 million). Other platforms that received over one million visitors during the last six months included US's Canvas Network (1.35 million), Jordan's Edraak (1.47 million), UK's FutureLearn (5.89 million), China's iCourse163 (3.59 million), India's Swayam (2.79 million), and US's Udacity (5.82 milion)

Table 4 indicates that most regional platforms attracted visitors mainly from their local country (e.g., XuetangX, Xu Yin Online, and Zhihuishu from China; Swayame from India; Openedu.rus from Russia; ThaiMOOC from Thailand; K-MOOC from Korea; eWant and Gacco from Taiwan; and Prometheus from Ukraine). However, the major global platforms achieved a balanced distribution of visitors from many different countries. So, although Coursera, edX, Udacity, and Udemy were located in US, they attracted international visitors from all over the world. Similarly, FutureLearn (UK) and Iversity (Germany) attracted visitors from various countries. Another interesting result is that many platforms offering MOOCs in a specific language attracted visitors from countries where that language was also spoken. So, Edraak (Jordan) and Rwaq (Saudi Arabia) attracted visitors from Arabic-speaking countries, MiriadaX (Spain) attracted visitors from Spanish-speaking countries, and OpenHPI (Germany) attracted visitors from German-speaking countries.

Visitors came directly to well-known global platforms (e.g., Coursera, edX, Udacity, Udemy). These platforms had already established their brand name and MOOC learners knew them. Similarly, locals visited regional platforms directly (e.g., Edraak, eWant, Federica Web learning, Fun-MOOC, iCourse163, Iversity, K-MMOC, MexicoX, MiriadaX, Openedu.ru, OpenHPI, XuetangX, Xue Yin Online, Zhihuishu). Many visitors, perhaps not yet well acquainted with a platform, came to Canvas Network (80%), FutureLearn (41%), Gacco (41%), and Rwaq (41%) via search engine results. Another interesting observation is that a large percentage (25%) of ThaiMOOC's visitors came to it through social media. Perhaps ThaiMOOC has done a successful marketing champaign in social media, or it may be that Thai people use social media a great deal.

Table 5 presents data on the popularity of MOOC platforms. The most popular platforms, pointed to by over 100,000 Websites, were Coursera (110,000) and Udemy (124,000), followed by edX (54,000), Future Learn (27,000), and Udacity (31,000). In addition, many other platforms had become well-known enough that more than 1,000 Websites hyperlinked to each of them: Canvas Network (4,000), Fun-MOOC (7,500), Iversity (3,000), Kadenze (1,500), MiraiasX (4,500), OpenHPI (1,500), Open Universities Australia (1,500), and Swayam (3,300). The majority of Websites that pointed to most platforms were located in the US. However, for some regional platforms, the majority of Websites that hyperlink to them were located in the platform's local country. So, EduOpen, EMMA, and Federica were mainly highlighted in Italian websites; Fun-MOOC was mainly linked to by French Websites; OpenHPI was mainly referred to by German Websites; and Swayam was mainly pointed to by Indian websites. However, it was strange that the Chinese platform Xue Yin Online was mainly pointed to by Indian Websites. This may be because Xue Yin Online was established in 2017 and had not yet had time to become known; only 48 Websites pointed to it.

Table 5

MOOC Platforms' Popularity: Websites and Links

MOOC platform	No. of Websites pointing to platform	Distribution of Websites by country (%)	No. of links pointing to platform	Age of links (%)					
				2021	2020	2019	2018	2017	2016
Canvas Network	4,086	comUS (45) orgUS (13) eduUS (5) netUS (5) Spain (2) Canada (2)	76,010	6	15	22	12	13	8
CNMOOC	115	comUS (43) eduChina (12) netUS (8) orgUS (6) Taiwan (5) China (2) Hong Kong (2) eduTaiwan (2) Spain (2) India (2)	576	26	9	29	21	13	2
Coursera	109,773	comUS (51) orgUS (11) netUS (4) Brazil (2) Germany (1) Canada (1)	807,003	47	11	8	12	12	5
Edraak	310	comUS (39) orgUS (17) India (3) eduUS (3) netUS (3) coIndia (2) Netherlands (2) Spain (2) UK (1) EU (1)	1,174	0	0	20	33	24	12
EduOpen	393	Italy (45) comUS (17) eduItaly (5) govItaly (5) orgUS (5) EU (5) netUS (2) Germany (1)	15,528	19	14	24	27	14	2
edX	54,371	comUS (47) orgUS (13) netUS (5) Brazil (2) Germany (2)	1,009,643	12	18	19	16	16	5
EMMA	460	Italy (21) comUS (17)	5,018	0	0	16	25	38	12

MOOC platform	No. of Websites pointing to platform	Distribution of Websites by country (%)	No. of links pointing to platform	Age of links (%)					
				2021	2020	2019	2018	2017	2016
		govItaly (11) EU (7) orgUS (7) Netherlands (4) France (4) netUS (3) UK (3)							
eWant *	148	comUS (20) eduTaiwan (15) India (15) coIndia (11) orgUS (6) netIndia (3) Taiwan (3) infoUS (2) netUS (2)	1,234	8	50	13	5	21	0.9
Federica Web Learning	546	Italy (43) comUS (20) orgUS (6) EU (4) eduItaly (3) netUS (2) infoUS (1) govItaly (1)	15,452	8	27	16	18	8	21
Fisdom	19	comUS (58) India (11) Japan (11) netUS (5) orgUS (5)	328	0	0	45	26	22	8
Fun-MOOC	7,574	France (38) comUS (25) orgUS (13) netUS (4) EU (3) Belgium (2)	187,219	10	23	30	19	11	3
FutureLearn	27,043	comUS (39) orgUS (11) coUK (8) orgUK (5) netUS (3) Netherlands (2) acUK (1) EU (1)	544,372	19	27	17	12	11	5
Gacco	126	comUS:38 Japan (14) coIndia (6) India (6) netUS (6) orgUS (5) acJapan (4) coJapan (2)	333	0	0	20	23	31	9

MOOC platform	No. of Websites pointing to platform	Distribution of Websites by country (%)	No. of links pointing to platform	Age of links (%)					
				2021	2020	2019	2018	2017	2016
JMOOC			?						
iCourse163	511	comUS (37) eduChina (9) China (8) Palau (6) orgUS (5) India (4) coIndia (3) netUS (3) topUS (3) Taiwan (2)	4,006	41	18	21	8	11	1
IndonesiaX	0	comUS (42) Palau (8) Indonesia (8) India (5) netUS (5) ac.Indonesia (5) coIndia (5) orgUS (4) coIndonesia (3) netIndia (2)	0	11	19	21	19	19	6
Iversity	2,895	comUS (33) Germany (22) orgUS (9) netUS (4) EU (3) Italy (3) Romania (2) Spain (2) Switzerland (1) Netherlands (1)	36,335	0	0	8	18	29	9
Kadenze	1,568	comUS (50) orgUS (10) netUS (7) eduUS (3) India (2) Canada (1) Germany (1)	16,053	29	11	20	16	18	3
K-MOOC	-	-	--						
MexicoX *	721	comUS (26) eduMexico (19) Mexico (12) comMexico (7) govMexico (6) orgUS (5) netUS (4) Palau (4) India (3) orgMexico (3)	7,994	9	18	35	22	12	0.3
MiriadaX	4,534	comUS (43) Spain (15)	153,524	12	11	15	8	23	9

MOOC platform	No. of Websites pointing to platform	Distribution of Websites by country (%)	No. of links pointing to platform	Age of links (%)					
				2021	2020	2019	2018	2017	2016
		orgUS (8) netUS (5) Chile (2) Brazil (2) Mexico (1) Argentina (1)							
Open Education Taiwan			?						
Openedu.ru			?						
OpenHPI	1,573	Germany (50) comUS (19) orgUS (6) netUS (5) Austria (3) EU (2) Switzerland (2)	26,914	15	24	15	13	12	5
Open Learning Japan			?						
Open Universities Australia	1,561	comUS (39) comAustralia (17) orgUS (6) netUS (4) eduAustralia (3) orgAustralia (3) Palau (2) India (2) infoUS (1)	46,400	15	11	17	16	20	12
Prometheus	321	comUS (21) Palau (9) orgUS (9) India (7) Ukraine (6) coIndia (5) comUkraine (5) netUS (4) eduUkraine (2) netIndia (2)	2,451	49	30	6	4	6	3
Rwaq (Riwaq or Rewaq)	328	comUS (42) Palau (9) India (7) orgUS (6) coIndia (5) netUS (5) infoUS (2) netIndia (2)	1,985	12	21	22	10	10	9
Swayam	3,370	acIndia (4) comUS (24) India (15) orgUS (12)	216,443	26	34	21	12	5	0.6

MOOC platform	No. of Websites pointing to platform	Distribution of Websites by country (%)	No. of links pointing to platform	Age of links (%)					
				2021	2020	2019	2018	2017	2016
		eduIndia (10) coIndia (2) orgIndia (2)							
ThaiMOOC	217	comUS (26) acThailand (12) Palau (12) India (1) coIndia (7) orgUS (6) govThailand (5) netUS (4) netIndia (2)	3,378	17	37	25	8	13	0.1
Udacity	30,096	comUS (52) orgUS (12) netUS (5) Germany (2) eduUS (1)	450,815	14	19	13	15	15	5
Udemy	124,260	comUS (59) orgUS (7) netUS (4) Brazil (2) Germany (2) UK (2) Italy (1)	2,508,417	18	24	21	14	14	4
XuetangX *			?						
Xue Yin Online	48	India (35) coIndia (29) comUS (19) netIndia (10) eduChina (2) eduMacao (2)	58	16	22	62	0	0	0
Zhihuishu			?						

Note. A question mark means that data were not available. * Indicates there were connection problems in reviewing the platform.

It is apparent from Table 5 that although similar numbers of Websites pointed to Coursera (110,000) and Udemy (124,000), the number of hyperlinks pointing to them differed greatly. A huge number of hyperlinks pointed to Udemy (2.5 million), followed by edX (1 million), Coursera (807,000), FutureLearn (544,000), and Udacity (451,000). Over 100,000 links pointed to each of the following regional platforms: Fun-MOOC (187,000), MiriadaX (154,000), and Swayam (216,000).

The evolution of a platform's visibility became apparent through examining the number of links to a platform over the years. For example, among the 2.5 million links pointing to Udemy, 4% were created in 2016, 14% in 2017, 14% in 2018, 21% in 2019, 24% in 2020, and 18% in 2021 (see Table 5). It is interesting to note that during 2021, Coursera and Prometheus managed to double the number of links pointing to

them. Also, during 2020 to 2021, eWant, iCourse163, and Swayam substantially increased the numbers of links pointing to them. One reason for this increase was the rising demand for online learning during the COVID-19 pandemic (Perifanou et al., 2022; Asare et al., 2021; Lee et al., 2022). It is possible that these platforms exploited the increased demand for online learning and attracted the attention of many Websites. They may also have invested in large marketing campaigns to promote their Websites. On the other hand, Edraak, EMMA, Fisdom, Gacco, and Iversity did not gain links during the 2020 to 2021 period. It seems that these platforms did not take advantage of the growing demand for online learning, and lost the chance to increase their visibility during the pandemic period.

Visitor Engagement

Visitors to Federica stayed for the longest time (Table 6); the average visit duration at Federica was more than 21 minutes. Note that all MOOCs on Federica were free of charge. Also, visitors stayed more than 10 minutes at Coursera (11:51), eWant (10:07), iCourse163 (11:50), ThaiMOOC (13:58), Udacity (12:10), Udemy (11:06), and XuetangX (12:01). On the other hand, visitors stayed the shortest time at Canvas Network (1:36). On average, a visitor remained at a platform for eight minutes.

Table 6

MOOC Platforms: Visitor Engagement and Technical Characteristics

MOOC platform	Avg. visit duration (min:sec)	Avg no. of pages per visit	Bounce rate (%)	Speed	Mobile-friendly?	Access Errors	Contrast Errors	Access Alerts
Canvas Network	01:36	2.83	56	11	Yes	1	5	3
CNMOOC	?	?	?	?	?	?	?	?
Coursera	11:51	8.61	32	26	Yes	?	?	?
Edraak	09:25	7.25	40	15	Yes	32	1	38
EduOpen	?	?	?	26	Yes	56	48	15
edX	09:12	6.83	37	25	Yes	?	?	?
EMMA	?	?	?	59	Yes	71	118	90
eWant *	10:07	12.29	36	17	Yes	29	16	82
Federica Web Learning	21:17	14.22	23	21	Yes	30	3	15
Fisdom	?	?	?	62	No	17	36	95
Fun-MOOC	06:49	6.77	40	35	Yes	2	1	5
FutureLearn	06:02	6.24	52	30	Yes	0	0	42
Gacco	05:54	6.24	38	40	Yes	1	9	13
JMOOC	?	?	?	45	Yes	73	128	87
iCourse163	11:50	8.5	24	23	Yes	5	7	4
IndonesiaX	?	?	?	5	Yes	?	?	?

MOOC platform	Avg. visit duration (min:sec)	Avg no. of pages per visit	Bounce rate (%)	Speed	Mobile-friendly?	Access Errors	Contrast Errors	Access Alerts
Iversity	02:01	3.27	52	43	Yes	37	19	26
Kadenze	03:19	9.65	49	19	Yes	26	6	86
K-MOOC	05:44	8.08	39	31	No	?	?	?
MexicoX *	09:16	6.21	36	37	Yes	27	39	142
MiriadaX	04:57	5.45	51	16	Yes	5	6	28
Open Education Taiwan	?	?	?	25	Yes	72	75	46
Openedu.ru	06:25	6.05	45	40	Yes	46	11	29
OpenHPI	08:49	5.95	36	39	Yes	11	25	77
Open Learning Japan	?	?	?	61	Yes	106	30	120
Open Universities Australia	03:01	4.59	43	29	Yes	0	0	9
Prometheus	06:37	5.17	50	26	Yes	45	69	154
Rwaq (Riwaq or Rewaq)	05:56	5.98	51	21	Yes	49	28	38
Swayam	03:07	2.69	45	69	Yes	0	0	14
ThaiMOOC	13:58	13.57	30	29	Yes	49	5	51
Udacity	12:10	8.11	32	42	Yes	9	0	12
Udemy	11:06	6.71	35	34	Yes	2	4	4
XuetangX *	12:01	7.35	30	5	Yes	?	?	?
Xue Yin Online	06:06	8.77	21	45	?	?	?	?
Zhihuishu	09:43	6.96	25	97	Yes	62	56	125

Note. A question mark means that data were not available. * Indicates there were connection problems in reviewing the platform.

Table 6 indicates that, the greatest average number of pages per visit was to Federica (14.22), ThaiMOOC (13.57), and eWant (12.29). By comparison, the least average number of pages per visit was to Canvas Network (2.83), Iversity (3.27), and Swayam (2.69). Overall, the average number of pages per visit was 7.2.

Federica, iCourse163, ThaiMOOC, XuetangX, Xue Yin Online, and Zhihuishu achieved a bounce rate less than or equal to 30%. It is notable that most of these platforms were Chinese. One possible explanation is that these platforms have designed their Websites in such a way that visitors stayed longer and visited many pages. Another explanation may be related to visitors' personal, cultural, or other characteristics. In contrast, almost half of the visitors to Canvas Network, FutureLearn, Iversity, MiriadaX, and Rwaq left the

platform after viewing just one page.

Platforms' Technical Characteristics

A platform speed score of 90 or above was considered good. A score between 50 to 90 meant that the platform needed improvement, and a score below 50 was considered poor. As shown in Table 6, almost all platforms (with the exception of Zhihuishu) needed to increase their speed. Zhihuishu showed almost perfect speed, while EMMA, Federica, Open Learning Japan, and Swayam achieved a moderate speed. The rest of the platforms performed extremely poorly, and they urgently need to increase their speed.

Most platforms were mobile-friendly with the exception of Fisdom and K-MOOC. For these two platforms, the Google mobile-friendly tool indicated that the text was too small to read and clickable items were very close to each other. Platforms showed mixed results regarding their accessibility. Some platforms had very few accessibility and contrast errors while other platforms performed poorly. In particular, Canvas Network, Fun-MOOC, FutureLearn, Gacco, Open Universities Australia, Swayam, and Udemy show few accessibility and contrast errors or none at all. On the other hand, many accessibility and contrast errors were detected in EdOpen, EMMA, JMOOC, Open Education Taiwan, Openedu.ru, Open learning Japan, Prometheus, Rwaq, ThaiMOOC, and Zhihuishu.

Conclusions, Limitations, and Future Research

This study analyzed 35 MOOC platforms from around the world. It employed both manual and automatic evaluation methods. Each platform was thoroughly explored and several metrics were recorded. This information was also combined with data from MOOC platforms' directories. Five Web analytics tools used to automatically measure various metrics of the platforms; in total, 21 metrics were recorded. The findings revealed that some platforms had developed many partnerships with universities, companies, and others, and were offering thousands of MOOCs on a variety of subjects. Although most MOOCs were in English or in the local language where the platform resided, efforts had been made to offer MOOCs in various languages. On the other hand, some platforms had only a few partners and offered a scant number of MOOCs in a limited range of subjects and languages. These platforms should be encouraged to increase their number of (a) partners, (b) MOOCs offered, (c) MOOC subjects, and (d) MOOC languages.

Some platforms had millions of registered users while others a few thousand. Major global platforms (e.g., Coursera, edX, Udacity, Udemy) had an international appeal and attracted visitors from all over the world. On the other hand, regional platforms mainly attracted users from countries where the language spoken was the same as that in the platform's host country. Expanding a platform to offer many MOOCs in various subject and languages would help attract partners and learners from all over the world. Also, offering MOOCs free of charge would help a platform to attract learners. Platforms should make efforts to increase their visibility, brand name recognition, and popularity worldwide. Collaboration with other educational institutes, organizations, and companies would serve to increase their ranking, as well as the number of Websites and hyperlinks pointing to them. Platforms should develop marketing campaigns on search engines, Websites, and social media.

Some platforms succeeded in engaging users for long periods while others failed to have users stay after they viewed the platform's first page. On average, a visitor stayed on a platform for 8 minutes and visited 7.2 pages per visit. By offering an easy-to-use interface and structure, efficient search engine and filters, as well as free educational material and other interesting resources, a platform would attract visitors to stay longer time and visit more pages per visit. Finally, almost no platforms had adequate speed. Even so, most platforms provided mobile-friendly pages. Some platforms presented few accessibility and contrast errors while others had many accessibility issues. Overall, it is important that platforms improve their speed and accessibility while remaining mobile-friendly.

One of the limitations of this study was that the measurements given by the Web analytics tools were not always accurate. Their measurements can even change after some time period. Even so, these measurements could be used as a current picture of the MOOC platforms landscape. Also, they can be used by a platform's administrators to compare their platform to others. The results of this study may serve to motivate administrators to enhance their platforms by taking appropriate actions. Administrators may also be inspired by the tactics of successful platforms such as Coursera and Udemy. Future research could use other evaluation methods and criteria, such as usability and openness (Economides & Perifanou, 2018a; 2018b), to measure the quality of platforms as well as analyze platforms' business and revenue models. Finally, future research may investigate methods to increase a platform's number of MOOCs, partners, registered users, Websites and links pointing to it, degree of user engagement, and accessibility.

Declaration of Conflict of Interest

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

This publication has been partially supported by Erasmus+ project OPENLang Network 2018- 1-ELO1-KA203-047967. This publication reflects the views only of the authors. The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

References

Agrawal, P., Kumar, A., & Agrawal, A. (2015). Massive open online courses: EdX.org, Coursera.com and NPTEL. A comparative study based on usage statistics and features with special reference to India. In *10th International CALIBER 2015* (pp. 390–402). HP University and IIAS, India: INFLIBNET Centre. http://hdl.handle.net/1944/1879

Alario-Hoyos, C., Pérez-Sanagustín, M., Delgado-Kloos, C., & Munoz-Organero, M. (2014). Delving into participants' profiles and use of social tools in MOOCs. *IEEE Transactions on Learning Technologies*, *7*(3), 260–266. https://doi.org/10.1109/TLT.2014.2311807

Alemayehu, L., & Chen, H.-L. (2021): Learner and instructor-related challenges for learners' engagement in MOOCs: A review of 2014–2020 publications in selected SSCI indexed journals, *Interactive Learning Environments*, https://doi.org/10.1080/10494820.2021.1920430

Alkaff, A., Qomarudin, M., Alkaff, S. & Bilfaqih, Y. (2018). Modelling online course services and comparison of its major providers. *International Journal of Emerging Technologies in Learning* (iJET), 13(1), 65-81. https://doi.org/10.3991/ijet.v13i01.7528

Antonova, A., & Bontchev, B. (2020). Investigating MOOC platforms as a prospective tool for mobile learning. In *Proceedings of the 16th International Conference Mobile Learning 2020* (pp. 31–38). https://doi.org/10.33965/ml2020_202004L004

Asare, A. O., Yap, R., Truong, N., & Sarpong, E. O. (2021). The pandemic semesters: Examining public opinion regarding online learning amidst COVID-19. *Journal of Computer Assisted Learning*, *37*(6), 1591–1605. https://doi.org/10.1111/jcal.12574

Ayoub, A., Amin, R., & Wani, Z. A. (2020). Contribution of developed countries towards MOOCs: An exploration and assessment from a representative platform Coursera. *Asian Association of Open Universities Journal, 15*(2), 251–262. https://doi.org/10.1108/AAOUJ-03-2020-0016

Brahimi, T., & Sarirete, A. (2015). Learning outside the classroom through MOOCs. *Computers in Human Behavior, 51*, 604–609. https://doi.org/10.1016/j.chb.2015.03.013

Cisel, M. (2019). The structure of the MOOC ecosystem as revealed by course aggregators. *American Journal of Distance Education*, *33*(3), 212–227. https://doi.org/10.1080/08923647.2019.1610285

Clark, D. (2013). *MOOCs: Taxonomy of 8 types of MOOC.* http://donaldclarkplanb.blogspot.co.uk/2013/04/moocs-taxonomy-of-8-types-of-mooc.html

Conache, M., Dima, R., & Mutu, A. (2016). A comparative analysis of MOOC (massive open online course) platforms. *Informatica Economica*, *20*(2), 5–14, https://doi.org/10.12948/issn14531305/20.2.2016.01

Cornejo-Velazquez, E., Clavel-Maqueda, M., Perez-Lopez-Portillo, H., & Lyubimova, E. (2020). Business model of learning platforms in sharing economy. *The Electronic Journal of e-Learning*, *18*(1), 102–113. https://doi.org/10.34190/EJEL.20.18.1.008

Costa, C., Teixeira, L., & Alvelos, H. (2018). Exploring the usage of MOOCs in higher education institutions: Characterization of the most used platforms. *International Journal of Information and Communication Technology Education*, *14*(4), 1–17. https://doi.org/10.4018/IJICTE.2018100101

Economides, A.A., & Perifanou, M. (2018a). MOOC affordances model. In *Proceedings of the IEEE Global Engineering Education Conference (EDUCON)*, Santa Cruz de Tenerife, Spain, April 18-20, pp. 605-613. https://doi.org/10.1109/EDUCON.2018.8363285

Economides, A.A., & Perifanou, M. (2018b). Dimensions of Openness in MOOCs & OERs. In: Proceedings EDULEARN, 10th annual International Conference on Education and New Learning Technologies, Palma de Mallorca, Spain, July 2-4, pp. 3684-3693. IATED. https://doi.org/10.21125/edulearn.2018.0942

European Commission. (2016). *What is open education*? https://ec.europa.eu/jrc/en/open-education

Ferguson, R., & Clow, D. (2015). Examining engagement: Analysing learner subpopulations in massive open online courses (MOOCs). In *Proceedings of the 5th International Conference on Learning Analytics and Knowledge* (pp. 51–58). Association for Computing Machinery. https://doi.org/10.1145/2723576.2723606

Funieru, L. M., & Lăzăroiu, F. (2016). Massive open online courses (MOOCs): A comparative analysis of the main platforms. *Informatica Economica*, *20*(2), 35–45. https://doi.org/10.12948/issn14531305/20.2.2016.04

Gamage, D., Fernando, S., & Perera, I. (2015, August). Quality of MOOCs: A review of literature on effectiveness and quality aspects. In *Proceedings of the 8th International Conference on Ubi-Media Computing (UMEDIA;* pp. 224–229). Institute of Electrical and Electronics Engineers. https://doi.org/10.1109/UMEDIA.2015.7297459

Goglio, V., & Nascimbeni, F. (2021). MOOCs in Italy: An open and fragmented landscape. *Italian Journal of Educational Technology*, 1-17. https://doi.org/10.17471/2499-4324/1233

Hakami, N., White, S., & Chakaveh, S. (2017, April). Motivational factors that influence the use of MOOCs: Learners' perspectives: A systematic literature review. In *Proceedings of the 9th International Conference on Computer Supported Education* (Vol. 2, pp. 323–331). SCITEPRESS. https://doi.org/10.5220/0006259503230331

Hidalgo, F. J. P., & Abril, C. A. H. (2020). MOOCs: Origins, concept and didactic applications: A systematic review of the literature (2012–2019). *Technology, Knowledge and Learning*, *25*(4), 853–879. https://doi.org/10.1007/s10758-019-09433-6

Jordan, K. (2014). Initial trends in enrolment and completion of massive open online courses. *The International Review of Research in Open and Distributed Learning*, *15*(1). https://doi.org/10.19173/irrodl.v15i1.1651

Lee, K., Fanguy, M., Bligh, B., & Lu, X. S. (2022). Adoption of online teaching during the COVID-19 pandemic: A systematic analysis of changes in university teaching activity. *Educational Review*, 1–24. https://doi.org/10.1080/00131911.2021.1978401

Li, K. C., Wong, B. T., Chok, E. W., & Lee, T. (2014). Profiling the characteristics of MOOC platforms. In *Proceedings from the 28th Annual Conference of the Asian Association of Open Universities* (pp. 476–485). Hong Kong SAR, China.

Lin, J., Kalbaska, N., Tardini, S., Frick, E. D., & Cantoni, L. (2015, June). A journey to select the most suitable MOOCs platform: The case of a Swiss University. In *EdMedia+ Innovate Learning* (pp. 273–283). Association for the Advancement of Computing in Education.

Liyanagunawardena, T. R., Lundqvist, K., Mitchell, R., Warburton, S., & Williams, S. A. (2019). A MOOC taxonomy based on classification schemes of MOOCs. *European Journal of Open, Distance and E-learning*, *22*(1), 85–103. https://doi.org/10.2478/eurodl-2019-0006

Maldonado-Mahauad, J., Valdiviezo, J., Carvallo, J. P., & Samaniego-Erazo, N. (2021). The MOOC-CEDIA Observatory. In *Proceedings of EMOOCs 2021*, 143. https://doi.org/10.25932/publishup-51715

Margaryan, A., Bianco, M., & Littlejohn, A. (2015). Instructional quality of massive open online courses (MOOCs). *Computers & Education*, *80*, 77–83. https://doi.org/10.1016/j.compedu.2014.08.005

Mays, T. J., Ogange, B., Naidu, S., & Perris, K. (2021). Supporting teachers moving online, using a MOOC, during the COVID-19 pandemic. *Journal of Learning for Development*, *8*(1), 27–41. https://jl4d.org/index.php/ejl4d/article/view/497

Oh, E. G., Chang, Y., & Park, S. W. (2020). Design review of MOOCs: Application of e-learning design principles. *Journal of Computing in Higher Education*, *32*(3), 455–475. https://doi.org/10.1007/s12528-019-09243-w

Perifanou, M., Economides, A. A., & Tzafilkou, K. (2022). Greek teachers' difficulties & opportunities in emergency distance teaching. *E-Learning and Digital Media*, 19(4). https://doi.org/10.1177/20427530221092854

Pilli, O., & Admiraal, W. F. (2016). A taxonomy for massive open online courses. *Contemporary Educational Technology*, *7*(3), 223–240. https://doi.org/10.30935/cedtech/6174

Purkayastha, N., & Sinha, M. K. (2021). Unstoppable study with MOOCs during COVID-19 pandemic: A study. *Library Philosophy and Practice*, https://digitalcommons.unl.edu/libphilprac/4791

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

Salas-Rueda, R. A., Castañeda-Martínez, R., Eslava-Cervantes, A. L., & Alvarado-Zamorano, C. (2022). Teachers' perception about MOOCs and ICT during the COVID-19 pandemic. *Contemporary Educational Technology*, *14*(1), ep343. https://doi.org/10.30935/cedtech/11479

Shah, D. (2018, January 22). *A product at every price: A review of MOOC stats and trends in 2017*. Class Central. https://www.classcentral.com/report/moocs-stats-and-trends-2017/

Shah, D. (2020, December 14). *The second year of the MOOC: A review of MOOC stats and trends in 2020*. Class Central. https://www.classcentral.com/report/the-second-year-of-the-mooc/

Shah, D., Pickard, L., & Ma, R. (2021). *Massive list of MOOC providers around the world*. Class Central. https://www.classcentral.com/report/mooc-providers-list/

Shanshan, S., & Wenfei, L. (2022). Understanding the impact of quality elements on MOOCs continuance intention. *Education and Information Technologies*, 1-28. https://doi.org/10.1007/s10639-022-11063-y

Siemens, G. (2013). Massive open online courses: Innovation in education. In McGreal, R., Kinuthia, W., & Marshall S. (Eds), *Open educational resources: Innovation, research and practice* (pp. 5–16). Commonwealth of Learning and Athabasca University.

Singh, G. (2022). Quality of MOOC for teachers'professional development: Participants' perception. *The Online Journal of Distance Education and e-Learning*, *10*(1), 134–147.

United Nations. (1948). *Universal Declaration of Human Rights*. https://www.un.org/en/universal-declaration-human-rights/

Yousef A. M. F., Chatti, A. M., Schroeder, U., & Wosnitza, M. (2015). A usability evaluation of a blended MOOC environment: An experimental case study. *The International Review of Research in Open and Distributed Learning*, *16*(2). https://doi.org/10.19173/irrodl.v16i2.2032

Zancanaro, A., Nunes, C. S., & de Souza Domingues, M. J. C. (2017). Evaluation of free platforms for delivery of Massive Open Online Courses (MOOCs). *Turkish Online Journal of Distance Education*, 18(1), 166-181. https://doi.org/10.17718/tojde.285814

Zawacki-Richter, O., Bozkurt, A., Alturki, U., & Aldraiweesh, A. (2018). What research says about MOOCs–An explorative content analysis. *The International Review of Research in Open and Distributed Learning*, *19*(1). https://doi.org/10.19173/irrodl.v19i1.3356

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