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NAVIGATING THE DIGITAL SHIFT: A BIBLIOMETRIC ANALYSIS OF RESEARCH ON MOOCS (2015–2025)

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ABSTRACT

This study offers a comprehensive bibliometric analysis of global and Indian research on Massive Open Online Courses (MOOCs) during the period 2015–2025. Using a systematic five-stage methodology—comprising keyword identification, initial search, query refinement, statistical compilation, and data analysis—the research draws upon Scopus-indexed publications to examine scholarly trends in the MOOC landscape. Particular attention is paid to the Indian context, where government-led initiatives such as SWAYAM have significantly shaped the trajectory of MOOC adoption and research. Through the use of VOSviewer visualisation software, the analysis visualises patterns in publication growth, author collaboration, keyword clusters, and citation networks. The findings reveal a notable rise in research output over the decade, with India emerging as a key contributor to the global MOOC discourse. However, the study also identifies persistent challenges concerning digital access, learner engagement, and course completion. By mapping the evolving contours of MOOC research, this bibliometric review provides valuable insights for educators, policymakers, and researchers seeking to improve the design, delivery, and effectiveness of online learning platforms in India and beyond.

Keywords: *SWAYAM, MOOCs, MOOC, bibliometric analysis, VOSviewer, Digital Learning, India, Online Education, Higher Education.*

INTRODUCTION

Snyder (2019) highlights that literature reviews are essential in academic research, offering a thorough understanding of a specific field, synthesising existing knowledge, and pinpointing areas for further investigation. Without periodic review efforts, the accumulation of research can become fragmented, leading to what **Ozturk (2021)** referred to as a "heap" of knowledge. **Kraus *et al.* (2022)** highlights that the rapid increase in scientific literature, fuelled by the expansion of academic journals, conferences, and various publication platforms, has significantly heightened the demand for systematic reviews. Researchers frequently find it challenging to identify relevant studies due to the overwhelming volume of publications. **Linnenluecke *et al.* (2020)** noted that numerous reviews lack clear transparency in their selection criteria for including or excluding articles, which can raise doubts among readers about the thoroughness and impartiality of the analysis. **Tranfield et al. (2003)** noted that researchers often focus primarily on evidence from reputed journals, without adequately considering a wider range of publications, limiting the scope of their understanding. Consequently, traditional literature review methods such as narrative, critical, and meta-analysis often fall short in providing a holistic perspective.

To address these challenges, bibliometric analysis has emerged as a valuable tool, offering a systematic, quantitative assessment of research trends. With advancements in data processing, software packages, and visualisation tools, bibliometric analysis has gained considerable traction in academic fields like business and management **(Bahuguna *et al.* (2023; Forliano *et al.* (2021; Khan *et al.* (2022; Mukherjee *et al.* (2022; Rao *et al.* (2023; Tigre *et al.* (2023)). Donthu *et al.* (2021) & Romanelli *et al.* (2021)** have proposed methodological frameworks for carrying out bibliometric research, offering detailed procedures and practical guidance for its implementation. These guidelines equip researchers with essential tools to navigate vast datasets and derive meaningful insights

The present and future of education systems are based on the Internet. The online education has been enhancing and improving day by day using AI and machine learning techniques. MOOC are the best examples in this field. Frequently, MOOCs have been adopted by learners on a large scale because these kinds of platforms provide learners with individuality in education Applying bibliometric analysis to the field of MOOCs offers valuable

opportunities to assess the evolution of research, map trends, and identify gaps for further investigation. Given the rapid expansion of MOOCs globally, bibliometric insights can reveal the most influential authors, institutions, and regions contributing to this domain. By analysing keyword clusters, citation networks, and collaboration patterns, researchers can better understand the emerging themes and challenges in MOOCs research. Moreover, such analysis can help policymakers and educators make data-driven decisions to enhance the effectiveness and accessibility of MOOCs. In this context, adopting a well-structured bibliometric approach ensures a comprehensive and objective evaluation of the growing body of knowledge on MOOCs.

According to **CONACHE (2016),** Massive Open Online Courses (MOOCs) have emerged as a transformative force in education enabling learners from anywhere to take online academic courses offered by academic institutes via open access and with unlimited participation. **Shah (2021a)** analysed the statistics and trends of MOOCs and observed a post-COVID-19 decline in the interest in MOOCs in the universities driven by the shift to institutional online teaching and focussed on monetising the in-house digital online education. In India, the proliferation of MOOCs has been particularly significant due to governmental initiatives and the widespread adoption of digital technologies. The launch of Study Webs of Active Learning for Young Aspiring Minds (SWAYAM) platform exemplifies Indian Government's commitment to broaden the educational access and promote inclusive learning opportunities.

Dhawan (2020) and Hoq (2020) observed that the emergence of COVID-19 has necessitated that educational institutions provide courses or training through remote learning platforms. While some institutions may focus on refining their existing systems, others will need to establish entirely new frameworks to facilitate online education for students confined to their homes.

This paper aims to provide a comprehensive bibliometric analysis of the literature on the global growth of MOOCs, with a particular focus on India. By examining articles published and indexed in Scopus, the study categorises data based on the annual number of publications, contributions by country, citation impact, keyword clusters, and the most prolific authors in MOOCs research over the past five years. This analysis highlights prevalent research themes, identifies underexplored areas, and reveals gaps that present opportunities for future research on MOOCs. The study employs a bibliometric analysis methodology using the Scopus database, with the findings visualised through VOSviewer. Insights derived from this analysis are further explored through a literature review, offering a nuanced understanding of the current research landscape.

MASSIVE OPEN ONLINE COURSES (MOOCS)

Massive Open Online Courses (MOOCs) are broadly defined as digital learning environments designed to accommodate a large number of learners, accessible globally to individuals with internet connectivity. These courses are characterised by open enrolment policies that require no formal qualifications and provide a complete, often cost-free, educational experience entirely online. The term "massive" denotes the absence of restrictions on participant numbers, "open" highlights the elimination of barriers related to geography, admission requirements, or financial constraints, and "online" emphasises delivery via internet-based platforms.

The inception of MOOCs dates back to 2007 when David Wiley introduced an open-access online course at Utah State University. According to **Downes (2012)** the term "MOOC" was introduced in **2008** by **Dave Cormier and George Siemens** during the "Connectivism and Connective Knowledge" course signifying the inception of this innovative learning model. In **2011, Thrun** and his colleagues at Stanford University launched a free online course on Artificial Intelligence (AI), aiming to provide open access to quality education for anyone interested in the subject. This initiative marked a pioneering effort in offering a university-level AI course to the public at no cost, attracting an unprecedented enrolment of approximately 160,000 participants from 190 countries. The overwhelming response to this course underscored the global demand for accessible higher education and subsequently inspired other universities and institutions to develop and offer similar MOOCs in the ensuing years.

Since then, MOOCs have attracted widespread interest, both academically and institutionally. **Mohamed *et al.* (2018)** distinguishes between two primary models: connectivist MOOCs (cMOOCs), grounded in the theory of

connectivism, which prioritise interaction among learners, instructors, and resources; and extended MOOCs (xMOOCs), based on a behaviourist pedagogy, which replicates traditional lecture-based teaching practices commonly found in higher education institutions. Owing to their flexibility and scalability, MOOCs are recognised as a contemporary form of distance education that promotes lifelong learning opportunities. Prominent global platforms such as Udacity, FutureLearn, Coursera, and edX have collaborated with numerous universities to create MOOC content that aligns with specific regional and educational priorities.

There is not only one MOOCs platform. The table below is an example of MOOCs platform provider website.

Table I. WEBSITES PROVIDING MOOCS PLATFORM

Number	Website Name	Website URL Address
1	SWAYAM	https:///www.swayam.gov.in
2	Coursera	https://www.coursera.org
3	edX	https://www.edx.org/
4	Khan Academy	https://www.khanacademy.org/
5	Udemy	https://www.udemy.com/
6	FutureLearn	https://www.futurelearn.com/
7	Iversity	https://iversity.org/
8	The Great Courses	https://www.thegreatcourses.com/ , https://www.thegreatcoursesplus.com/
9	LinkedIn Learning	https://www.linkedin.com/learning/
10	MIT OCW	https://ocw.mit.edu/
11	OpenLearning	https://www.openlearning.com/
12	Stanford Online	https://online.stanford.edu/
13	Udacity	https://www.udacity.com/
14	Upskillist	https://www.upskillist.com/
15	OpenClassrooms	https://openclassrooms.com/en/

Bali (2025), reported that the global market for MOOCs was estimated at USD 39.20 billion in 2024, with expectations of growing at a compound annual growth rate (CAGR) of 39.1% between 2024 and 2039. **Laurie Pickard (2024)** in Class Central had documented over 200,000 online courses offered by various MOOC platforms and digital learning providers, encompassing a broad spectrum of academic disciplines and subject areas. This expansion reflects the increasing accessibility and diversity of MOOCs. Additionally, more than 220 million learners worldwide had enrolled in MOOCs, excluding enrolment figures from China, indicating a significant rise in global participation compared to previous years. These courses were offered by approximately 950 universities, collectively catering to around 220 million learners—an increase of nearly 40 million students within a year. The rapid growth in enrolment and course offerings has also contributed to heightened academic interest, leading to a growing body of scholarly literature that critically examines different dimensions of the MOOC phenomenon. For instance, **Al-Rahmi *et al.* (2019)** conducted a systematic review of 219 articles published between 2012 and 2017. Similarly, **Sezgin *et al.* (2021)** examined 82 peer-reviewed publications from 2014 to 2019 across five academic databases i.e. Web of Science," "IEEE Xplore," "Scopus," "Science Direct," and the "ACM Digital Library" databases. Veletsianos *et al.* (2016) analysed 183 publications—comprising conference papers and journal articles—from 2013 to 2015 in Scopus, while **Zhu *et al.* (2020)** reviewed 541 empirical studies on MOOCs published from 2009 to 2019, **Modise (2021)** reviewed 15 journal articles published between 2013 and 2020.

However, these studies demonstrate the size and growth of this research domain and highlight the need for a critical summary of MOOC research and the identification of areas for future research. To address this gap, we conduct a bibliometric review to map MOOC research. Although **Liu *et al.* (2019)** utilised a bibliometric approach, their analysis only extended to research trends up to 2019. Consequently, there remains a gap in terms of comprehensive and updated bibliometric insights into MOOC research.

To bridge this gap, the present study undertakes an extensive bibliometric analysis encompassing 4109 articles published and indexed in Scopus over the last decade. By examining articles, the study categorises data based on

the annual number of publications, contributions by country, citation impact, keyword clusters, and the most prolific authors in MOOC research over the past ten years. This analysis highlights prevalent research themes, identifies underexplored areas, and reveals gaps that present opportunities for future research on MOOCs. The study employs a bibliometric analysis methodology using the Scopus database, with the findings visualised through VOSviewer. Insights derived from this analysis are further explored through a literature review, offering a nuanced understanding of the current research landscape. Accordingly, the study seeks to answer the following research questions (RQs):

- **RQ1.** What are the annual trends in publications and citations?
- **RQ2.** Which references, sources, institutions, and countries have been most influential?
- **RQ3.** Who are the most productive and influential authors?
- **RQ4.** What are the patterns of co-authorship among authors and countries, and how are author keywords distributed?

METHODOLOGY

Study Design: This review aims to systematically examine the scholarly literature on Massive Open Online Courses (MOOCs) by employing a bibliometric mapping approach. The primary objective is to offer a global overview of research trends, publication patterns, citation dynamics, key authors, influential journals, leading institutions, contributing countries, and the thematic distribution of keywords within this domain. Bibliometric analysis, recognised as a widely adopted quantitative method, facilitates the exploration and evaluation of extensive scientific data, enabling researchers to identify patterns, research gaps, and emerging areas of inquiry within a specific academic field **(Donthu *et al.* (2021))**

Data Collection: A set of 4109 documents were collected through the Scopus database- *https://www.scopus.com*. For the purpose of this study, the Scopus database was selected owing to its broader and more inclusive coverage of scholarly publications compared to other scientific databases **(Donthu *et al.* (2021)).** Scopus is recognised as the largest indexing and abstracting database globally as it indexes more than 2.4 billion records, including articles from more than 27950 active, peer-reviewed journals and approximately 25.1 million conference papers sourced from more than 7,000 publishers worldwide **(Elsevier (2025)).** One of the key advantages of Scopus lies in its extensive disciplinary coverage, particularly in fields pertinent to higher education and international academic discourse, alongside its convenient access to structured bibliographic data **(Zupic et al. (2014)).** Additionally, Scopus offers a more comprehensive representation of research in educational disciplines than other databases such as Web of Science (WoS), thereby allowing for the inclusion of studies that might otherwise remain underrepresented **(Ghani et al. (2022)).** This wider scope made Scopus particularly suitable for capturing the breadth and depth of MOOCs-related research across Arts, Humanities, Pure Sciences, and Social Sciences.

After systematically applying the defined inclusion and exclusion criteria, the search yielded a total of 4109 relevant documents. The criteria applied in this selection process are summarised in Table II.

TABLE 2: INCLUSION AND EXCLUSION CRITERIA

Criteria
Inclusion Criteria (IC)
IC1. The keyword search was limited to the title, abstract, and keywords of the document
IC2. Documents focused on MOOCs and SWAYAM
IC2. Documents from subject areas of Science, Social Sciences, Arts and Humanities
IC2. The date of publication was limited from 2015 to 2025
IC3. All types of documents
Exclusion Criteria (EC)
EC1. Documents not related with MOOCs
EC2. Documents not related to Engineering, Technology, Medical, Healthcare, clinical and biomedical

The data search process in this study, which refers to the framework of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (Moher *et al.* (2009)), is presented in Fig. 1.

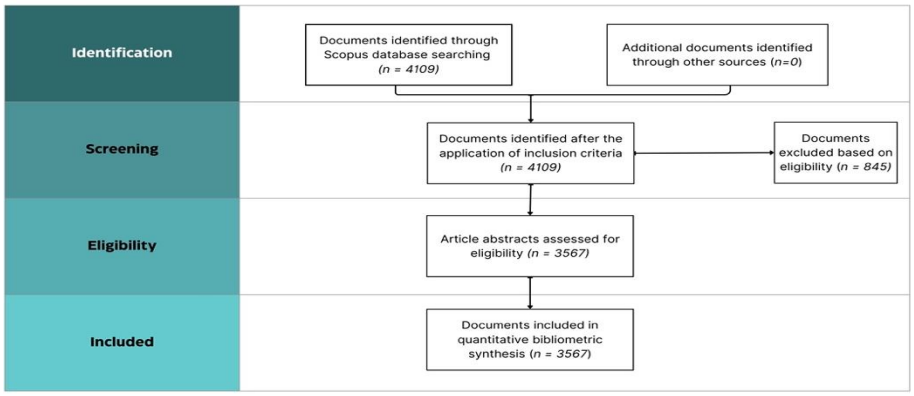

Fig 1. The research proposal

The metadata for this study was retrieved on January 30, 2025 imposing a limitation of year from 2015 to 2025. The dataset encompassed various types of scholarly documents, including articles, books, book chapters, conference papers, review articles, editorials, data paper and short surveys. This comprehensive approach was adopted to ensure a deeper understanding and clear picture of the MOOCs research landscape over the past decade. The following primary search was performed:

> (TITLE-ABS-KEY ("MOOC*" OR "Massive Open Online Course*") OR TITLE-ABS-KEY ("SWAYAM" OR "swayam" OR "Swayam") AND TITLE-ABS-KEY ("humanities" OR "arts" OR "social sciences" OR "education" OR "learning outcomes" OR "teaching pedagogy" OR "student engagement" OR "online learning experience" OR "education policy" OR "lifelong learning" OR "higher education" OR "academic performance" OR "educational access")) AND NOT TITLE-ABS-KEY ("engineering" OR "technology" OR "STEM" OR "medical" OR "healthcare" OR "clinical" OR "biomedical") AND PUBYEAR > 2014 AND PUBYEAR < 2026 AND PUBYEAR > 2014 AND PUBYEAR < 2026 AND PUBYEAR > 2014 AND PUBYEAR < 2026 AND (LIMIT-TO (SUBJAREA , "SOCI") OR LIMIT-TO (SUBJAREA , "COMP") OR LIMIT-TO (SUBJAREA , "DECI") OR LIMIT-TO (SUBJAREA , "ARTS") OR LIMIT-TO (SUBJAREA , "PSYC") OR LIMIT-TO (SUBJAREA , "ECON") OR LIMIT-TO (SUBJAREA , "MULT"))

Upon screening and applying inclusion and exclusion criteria, the final dataset comprised **3567** publications originating from **120 countries** and spanning **seven languages**. It is noteworthy that one article may be written in at least two different languages.

Data Analysis: The author independently searched for articles from the Scopus database and then evaluated the screened studies. The assessment started with the title, abstract, and keywords. The documents that meet the requirements were then collected. The author then performed data extraction. The author also classified each document based on the author's name, year, publishing venue, institution, country, and the number of citations. Of the 3567 documents, 44.44% were conference papers (n=1585), 40.37% were journal articles (n=1440), 7.81 % were book chapters and 5.39% were other document types (n=221). The data were then exported as CSV (comma-separated values) and RIS (research information systems) files. In this study, data analysis was carried out using Microsoft Excel®, primarily to compute descriptive statistics such as frequencies and percentages for the collected bibliometric information. VOSviewer (https://www.vosviewer.com/) was used to generate visual representations of bibliometric networks due to its user-friendly interface and robust visualisation capabilities (van Eck *et al.* (2010)). This software facilitated the mapping of co-authorship patterns, keyword co-occurrence, and citation networks. The analytical outcomes were presented through tables and network visualisation diagrams. In these visualisations, the size of each node corresponded to the number of publications, while the thickness of the connecting lines reflected the strength of collaboration or citation links between entities. Furthermore, keywords that frequently appeared together across the analysed documents were assigned the same colour and organised into clusters to illustrate thematic relationships.

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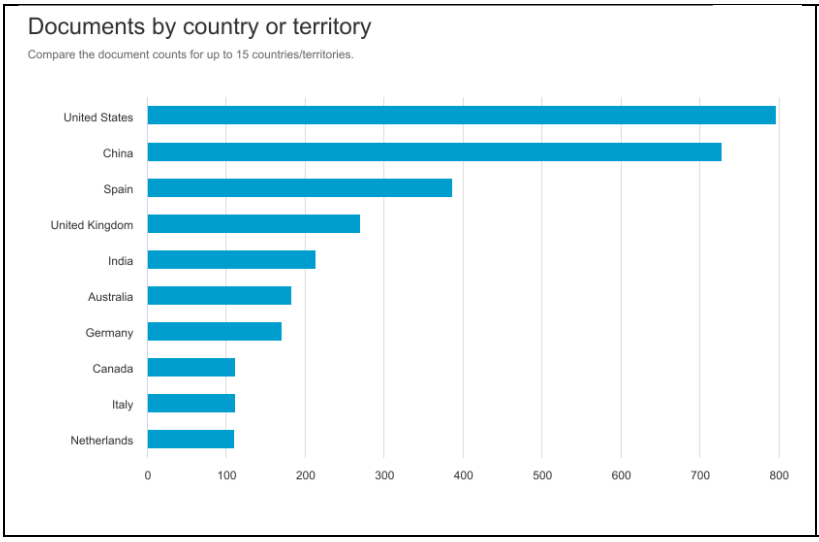
RESULTS

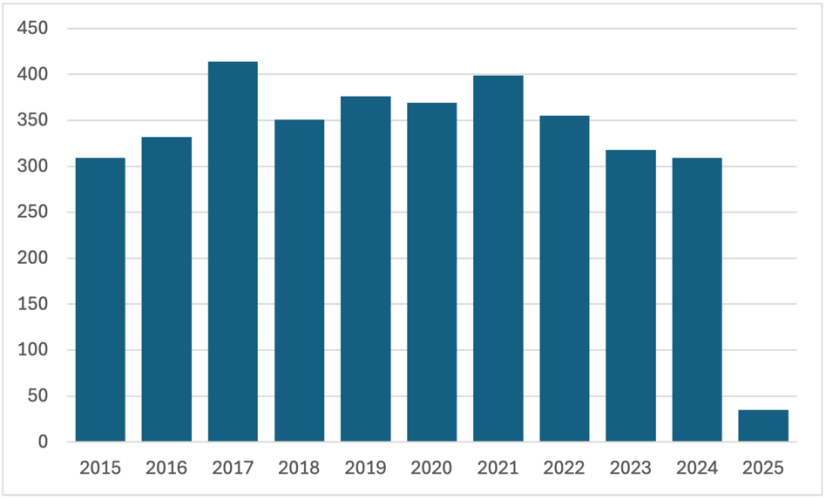
PUBLICATION AND CITATION TRENDS

The search results inform that a total of 3567 documents have been published during the decade of 2015-2025. Fig 2. depicts the publications and citations country-wise during the decade.



Country	Number
United States	798
China	728
Spain	384
UK	269
India	212
Australia	182
Germany	170
Italy	110
Canada	110
Netherlands	109

Fig. II Country-wise contribution



Year	Number of Publications
2015	309
2016	332
2017	414
2018	351
2019	376
2020	369
2021	399
2022	355
2023	318
2024	309
2025	35

Fig. III depicts the number of annual publications on MOOCs and SWAYAM throughout the years.

In the period of the first five years (2015-2019), there were 1782 publications (49.96 %) with an annual number of 366 publications. During the second five-year period (2020-2024), the number of publications was 1785 (49.06%). In 2025 (until this study was conducted), the number of publications was 35 (0.98%). In terms of the number of citations, this trend continues to increase from year to year, which corresponds to the increase in the volume of publications in the field. This increase indicates that the topic is attracting the attention of the researchers to carry on their research.

HIGHLY CITED DOCUMENTS

Table III: TOP 10 MOST CITED REFERENCES

Authors	Document Title	Year	Source	C	C/A
Zhang J.et al [Zhang *et al.* (2017)]	Dynamic key-value memory networks for knowledge tracing	2017	WWW2017	584	64.89
Margaryan A. et al [Margaryan *et al.* (2015)]	Instructional quality of Massive Open Online Courses (MOOCs)	2015	CaE	541	60.11
Hone K.S. et al [Hone *et al.* (2016)]	Exploring the factors affecting MOOC retention: A survey study	2016	CaE	535	59.44
Alraimi K.M.et al [Alraimi *et al.* (2015)]	Understanding the MOOCs continuance: The role of openness and reputation	2015	CaE	525	58.33
Littlejohn A.et al [Littlejohn *et al.* (2016)]	Learning in MOOCs: Motivations and self-regulated learning in MOOCs	2016	IHE	434	48.22
Hew K.F. [Hew (2016)]	Promoting engagement in online courses: What strategies can we learn from three highly rated MOOCS	2016	BJET	356	39.56
Jordan K. [Jordan (2015)]	Massive open online course completion rates revisited: Assessment, length and attrition	2015	IRRODL	325	36.11
Zheng S. et al [Zheng *et al.* (2015)]	Understanding student motivation, behaviors, and perceptions in MOOCs	2015	CSCW 2015	300	33.33
Onan A. [Onan (2021)]	Sentiment analysis on massive open online course evaluations: A text mining and deep learning approach	2021	CAEE	290	32.22
Barak M. et al [Barak *et al.* (2016)]	Motivation to learn in massive open online courses: Examining aspects of language and social engagement	2016	CaE	282	31.33

Notes: WWW2017: 26th International World Wide Web Conference, WWW 2017; CaE: Computers and Education; BJET: British Journal of Educational Technology; IHE: Internet and Higher Education; IRRODL: International Review of Research in Open and Distributed Learning; CSCW2015: CSCW 2015 - Proceedings of the 2015 ACM International Conference on Computer-Supported Cooperative Work and Social Computing; CAEE: Computer Applications in Engineering Education

MOST PRODUCTIVE SOURCES

In this study, the collection of 3567 documents was published in 1552 different publishing venues. Only 58 (3.37%) sources published 10 or more documents. The top 10 most productive sources regarding the number of total articles (A) are presented in Table IV.

Table IV: TOP 10 MOST PRODUCTIVE SOURCES

Source	A	C	C/A
ACM International Conference Proceeding Series	225	1729	7.68
Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	175	1298	7.42
CEUR Workshop Proceedings	111	357	3.22

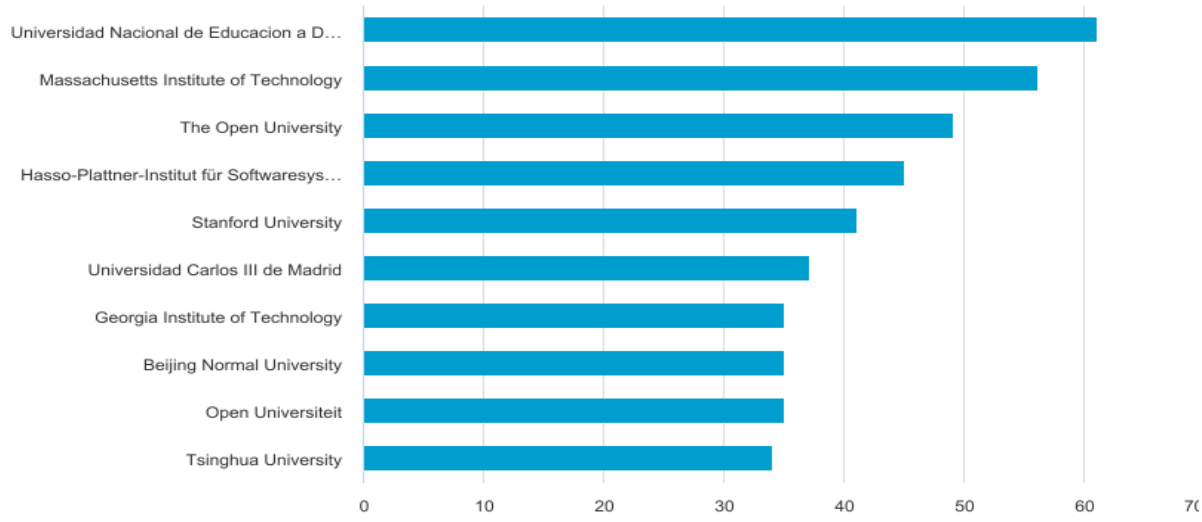
Communications in Computer and Information Science	72	248	3.44
International Review of Research in Open and Distributed Learning	62	2378	38.35
Computers and Education	61	5578	91.44
Advances in Intelligent Systems and Computing	44	108	2.45
Lecture Notes in Networks and Systems	38	101	2.66
International Journal of Emerging Technologies in Learning	35	278	7.94
Sustainability (Switzerland)	33	521	15.79

Accordingly, these 10 sources have published 856 documents, accounting for 23.99% of the publications with a number of citations of 12596 (26.1%). The *ACM International Conference Proceeding Series* has the largest number of articles published in this area with 225 papers and 1729 citations. *The Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics*) and *CEUR Workshop Proceedings* rank second and third respectively. Computers and Education, with 27.1 Citescore and 8.9 Impact Factor, had the highest number of citations per document, followed by the International Review of Research in Open and Distributed Learning and Sustainability (Switzerland).

MOST PRODUCTIVE INSTITUTIONS

The Universidad Nacional de Educacion a Distancia (Spain) is the most productive organisation in the top 10. The second position is Massachusetts Institute of Technology (US), followed by The Open University (UK). In Fig. IV, it can be seen that the US leads with three institutes with the most citations, China with two, Spain with two, the UK with one, Germany with one and the Netherlands with one institution.

Fig. IV TOP 10 MOST PRODUCTIVE INSTITUTIONS

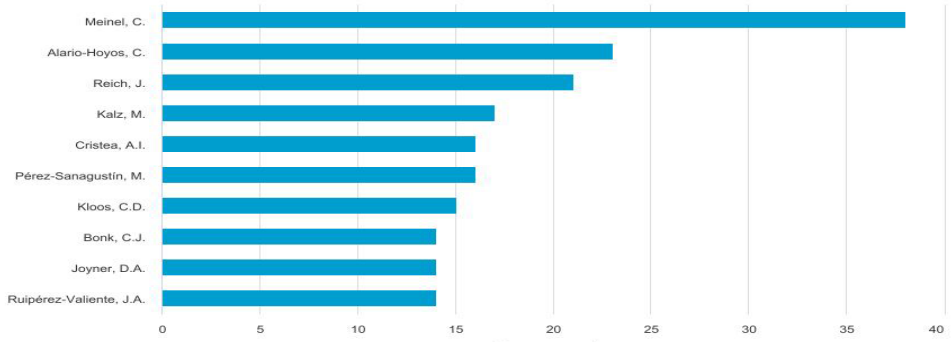


MOST PROMINENT AUTHORS

The top 10 most productive authors of MOOC publications from 2015 to 2025 are shown in Fig V. Among them, Christoph Meinel leads with 37 documents and 373 citations, followed by C. Alario-Hoyos with 23 documents and 1001 citations and J. Reich with 21 documents and 669 citations. Other notable contributors include M. Kalz (17 documents and 664 citations,), A.I. Cristea (16 documents and 72 citations), M. Pérez-Sanagustín (16 documents and 1055 citations), C.D. Kloos (15 documents and 476 citations), C.J. Bonk (15

documents and 370 citations), D.A. Joyner (13 documents and 131 citations), and J.A. Ruipérez-Valiente (13 documents and 414 citations). The frequency of citations attributed to these authors underscores their sustained scholarly engagement and influential role in advancing research within the domain of MOOCs over the past decade.

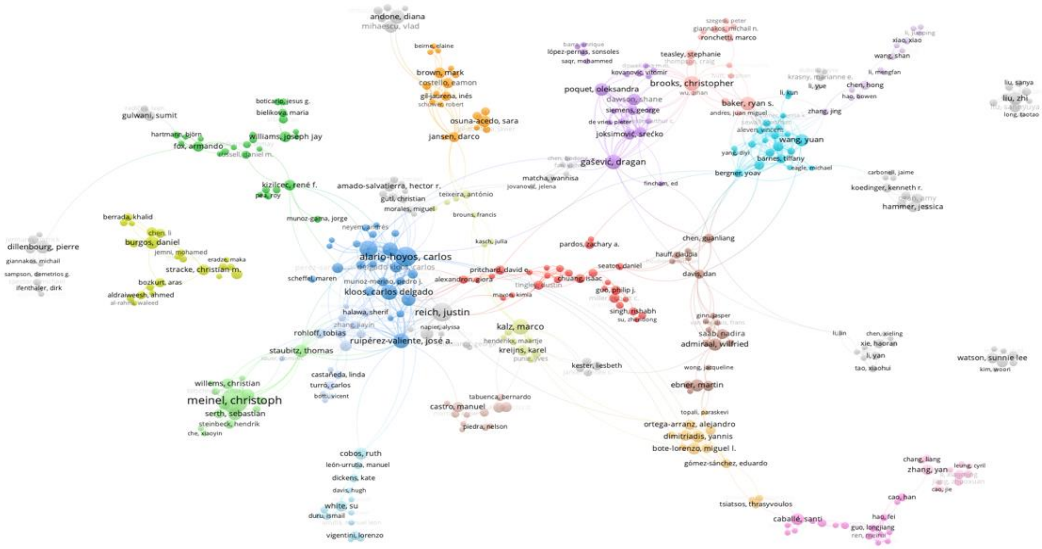
Fig. V: TOP 10 MOST PROMINENT AUTHORS



CO-AUTHORSHIP FOR AUTHORS AND COUNTRIES

In order to visualise the extent of scholarly collaboration among the authors, a co-authorship network analysis was conducted. This analytical technique is employed to illustrate instances where two or more authors have jointly contributed to a single publication (van Eck *et al.* (2010)). For this study, specific thresholds were established to ensure the relevance and significance of the network. The minimum publication criterion was set at two documents per author, while a minimum citation threshold of five citations per author was applied to include only those authors with a measurable academic impact. Out of 9410 authors, 1437 authors met the criteria. Out of these 1437 authors, 409 were well connected to form 30 clusters. Fig. VI depicts the entire collaboration network of 409 authors. Each node in the figure represents one author and the size of the node depicts the number of documents published by the author. The larger the size of the node, the more the documents are published by the author (van Eck *et al.* (2010)).

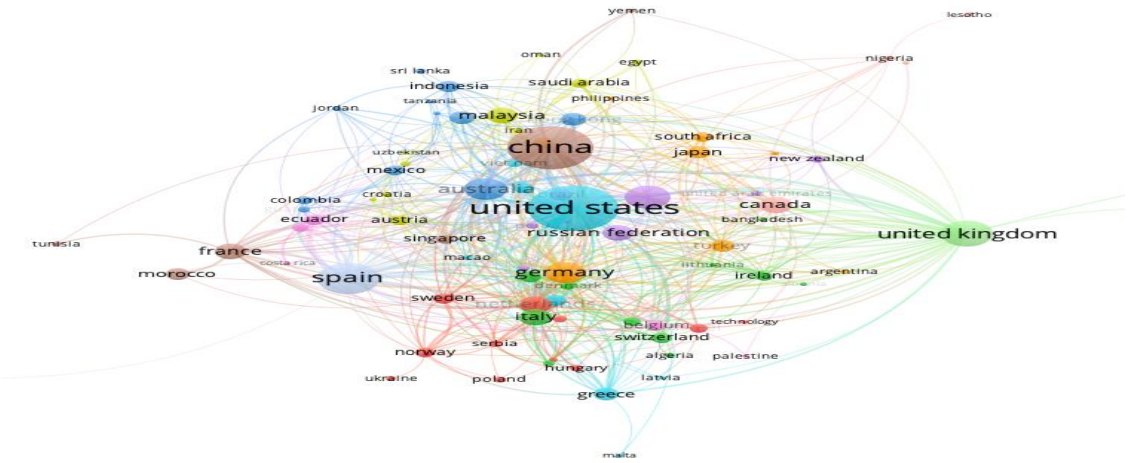
Fig.VI THE VISUALISATION NETWORK OF THE AUTHOR CO-AUTHORSHIP



Then, we analyse country co-authorship. Once we set the minimum number of documents of a country as 2 and the minimum number of citations of a country as 5, 92 countries/regions meet the requirements. All these

countries (out of 134) are divided into 12 clusters and cooperate. Using VOSviewer, a map of the co-authorship network is presented in Fig. VII

Fig. VII THE VISUALISATION NETWORK OF THE COUNTRY CO-AUTHORSHIP

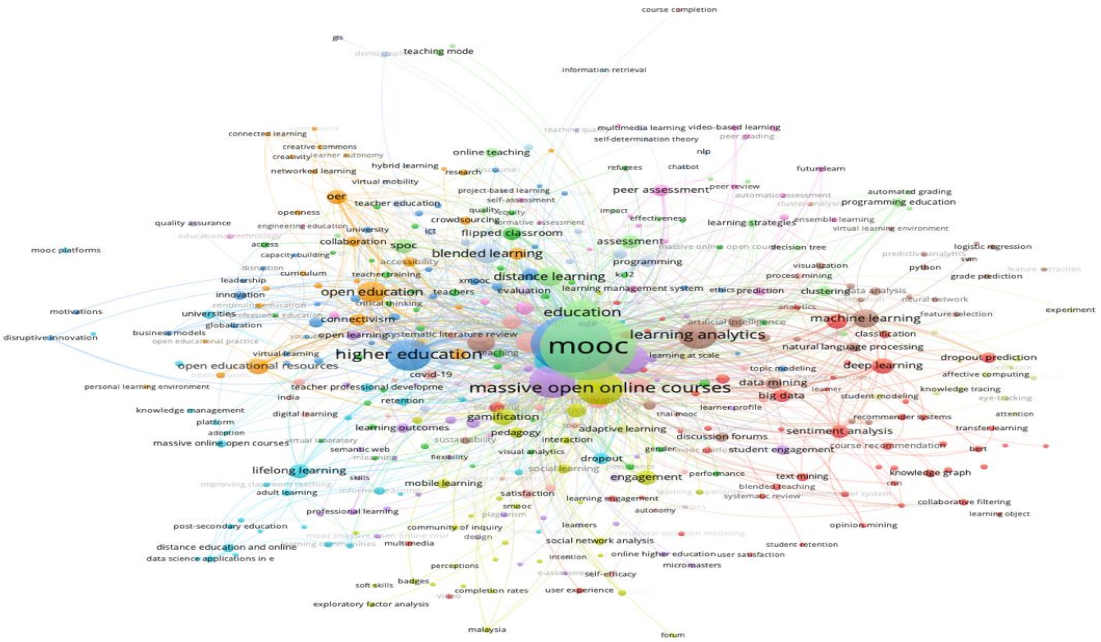


CO-OCCURRENCE OF AUTHOR KEYWORDS

To create a map showing the words used most in the titles, abstracts, and keywords, co-occurrence of author keywords analysis was chosen. To generate a keyword co-occurrence network, we used VOSviewer. Co-occurrence analysis represents the occurrence of an author keyword in a particular article (van Eck *et al.* (2010). The minimum number of occurrences of a keyword is set to be 5 and 403 keywords meet the threshold.

The overlay visualisation map of author keywords is then presented in Fig. VIII.

Fig.VIII CO-OCCURRENCE NETWORK VISUALISATION



In Fig. VIII, the analysis shows the frequency of the keywords. The most frequently encountered word was MOOC (1112 occurrences, 2176 TLS), MOOCs (809, 1557 TLS) and online learning (254, 647 TLS).

Fig. IX reveals the top 10 popular keywords in connection with MOOCs Research.

Fig. IX MOST FREQUENTLY USED KEYWORDS

Keyword	Occurrences	Total link strength
mooc	1112	2176
moocs	809	1557
online learning	254	647
higher education	240	608
massive open online courses	269	600
e-learning	233	581
learning analytics	193	503
online education	163	355
education	167	335
open education	106	304

DISCUSSIONS AND CONCLUSION

The present bibliometric analysis offers an in-depth overview of the evolution, structure, and dynamics of scholarly research on Massive Open Online Courses (MOOCs) between 2015 and 2025, with particular emphasis on the Indian context. The analysis of 3,567 documents retrieved from the Scopus database reveals a sustained scholarly interest in the domain, underscored by a notable increase in publications and citations over the study period. The data indicate that the global academic community has demonstrated a significant engagement with the subject, with substantial contributions from countries such as the United States, China, Spain, the United Kingdom, and India.

One of the salient findings of this study is the prominent role played by India in the global MOOC research landscape. The country's focused governmental initiatives, particularly the SWAYAM platform, have contributed to the growing volume of research output. Despite India's comparatively lower number of publications relative to countries like the United States and China, its strategic emphasis on digital education, as evidenced by policy frameworks and academic collaborations, is evident in the bibliometric trends.

The analysis further reveals that while conference proceedings and journal articles dominate the publication types, the citation impact of journal articles remains significantly higher, indicating their scholarly influence. Notably, journals such as *Computers and Education* and *International Review of Research in Open and Distributed Learning* emerge as key sources with high citation rates, reflecting the credibility and academic value of these publications within the field.

Co-authorship analysis illustrates a well-connected international research network, with collaborative efforts spanning multiple countries. However, the clustering patterns suggest that collaborations are often regionally concentrated, indicating opportunities for fostering more transnational academic partnerships, particularly involving underrepresented regions.

The keyword co-occurrence analysis identifies "MOOCs," "online learning," "higher education," and "student engagement" as dominant research themes. These findings are consistent with the global discourse on the integration of technology in education and underscore the pedagogical, institutional, and learner-centric concerns that continue to shape MOOC research.

Overall, the bibliometric trends reflect the increasing maturity of MOOC-related scholarship. However, the research community must address persistent challenges related to digital infrastructure, learner engagement, course completion rates, and equitable access to MOOCs. For India, in particular, future research should focus on assessing the effectiveness of initiatives like SWAYAM in fostering inclusive and sustainable digital learning ecosystems.

This study contributes to the existing body of knowledge by providing empirical insights into the growth trajectory and thematic evolution of MOOC research. The findings have implications for policymakers, educators, and researchers in terms of identifying research gaps, prioritising collaborative efforts, and designing evidence-based strategies for enhancing the quality and reach of MOOCs.

LIMITATIONS

While this study provides a comprehensive bibliometric analysis of MOOC research, it is not without limitations. First, the data collection was restricted to the Scopus database. Although Scopus is one of the most extensive and credible indexing platforms, it does not encompass all relevant publications, particularly those published in non-indexed regional journals or emerging academic platforms. Consequently, the analysis may not fully capture the complete spectrum of MOOC research, especially in developing countries where local publications play a vital role.

Second, the analysis was limited to documents published between 2015 and 2025, which, although recent and relevant, may exclude earlier foundational studies that could provide a broader historical context. Additionally, the study excluded publications related to engineering, technology, healthcare, and biomedical disciplines, which may have resulted in the omission of interdisciplinary research pertinent to MOOCs.

Third, the bibliometric methodology employed in this study, while systematic and replicable, primarily focuses on quantitative metrics such as publication counts, citations, and co-authorship networks. It does not account for the qualitative aspects of the publications, including the depth, rigor, and practical applicability of the research findings.

Lastly, due to the dynamic nature of digital education and the rapid technological advancements in online learning, the trends identified in this study may evolve, necessitating periodic updates and longitudinal assessments.

CONFLICT OF INTEREST

The author declares that there is no conflict of interest associated with the publication of this research article. The research was conducted independently, without any commercial or financial relationships that could be construed as a potential conflict of interest. All efforts were made to ensure the accuracy, objectivity, and integrity of the analysis presented in this study.

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