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From Metrics to Themes on Open Educational Resources: A Bibliometric Overview and Thematic Dive

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Abstract. Throughout the world, openness has undergone a substantial shift in the education scenario. In the context of an ever-increasing number of learners across diverse disciplines, open educational resources (OER) have proven to be an essential lifeline. These resources offer free and open assistance to educators in their academic careers. The open-access character of OER attracts learners who are interested in discovering and participating in discipline-specific knowledge, without cost. OERs make an instrumental contribution to the success of the open education movement. This paper provides a bibliometric overview of OER development from 2002 to 2025 and identifies key trends, influential publications and developing areas of study in the field. In addition, we performed thematic analysis of the top 100 most cited gold open-access articles published on the topic of OER to determine underlying themes and knowledge that have contributed to the development of the field. Collectively, these analyses provide a panoramic vision of the conceptual and practical development of OER.

Keywords: Open educational resources (OER); Open access; Bibliometrics; Thematic analysis; Higher education

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1. Introduction

Education has undergone transformative changes in the last decades. The learning mindset of people has changed to the extent that, today, people are engaged in learning for the sake of acquiring skills, achieving professional growth, exploring and understanding, and even for leisure. There was a time when knowledge sharing was difficult and information was not freely accessible to everyone. OER (open educational resources) has transfigured the traditional scenario by making knowledge available to every person who wishes to learn.

The concept of OER emerged in education only two decades ago. A groundbreaking incident occurred in 2001, when Massachusetts Institute of Technology enabled their course materials to be accessed free of charge online (Abelson, 2008). Soon many institutions had adopted this model, which led to the initiation, through collaboration, of the first Global OER Forum in 2002. By forging a path to circumvent conventional blockages facing access to information, OER has empowered education with equity and inclusivity.

'The term OER was defined as the open provision of educational resources, enabled by information and communication technologies, for consultation use and adaptation by a community of users for non-commercial purposes' (Gordillo et al., 2020). This trademark of open customisation and adaptation enabled educators to use these OER resources in the teaching-learning process. OER involves various materials, in digital in physical forms, which have been prepared for research, teaching and learning purposes. The materials are either in the public domain or licensed to permit free access, use, adaptation and redistribution by everyone, with few or no restrictions (Fengchun et al., 2019).

Foundational articles covering the development of OER emerged in early 2000s. In its infancy, OER was popularised via the use of e-textbooks. The inherent properties of e-textbooks strengthened their establishment in the education landscape. These properties include updatability and the dynamic alignment of information relevance with increased social benefits, such as shareability and accessibility. These properties influenced learners' attitudes towards OER in an increasingly positive way (Hilton, 2020).

In addition, OER has clearly provided students with a tangible advantage by lowering the considerable expense of buying conventional textbooks. The lower cost and ability of OER to do revision, modification and updating are a huge benefits, as is the flexibility OER offers teachers to adapt materials for their learning environments. In addition, OER has the potential to do timely adaptation of contents. These benefits enhanced learners' attitudes towards the use and adoption of OER in learning environments.

Multimedia resources such as audio, video and animations, as well as textbooks, curricula, syllabi, lecture notes, assignments and assessments, are all included in the broad category of OER (Fengchun et al., 2019). Scholars have found that incorporating OER in education practice can improve teaching quality, increase the effectiveness of instruction and reduce geographical and financial barriers to

learning (Hilton, 2016, 2020; Wiley & Hilton, 2018). Institutions that adopt OER report higher rates of student enrolment and retention (Zhao et al., 2020). The study credits this benefit to lower expenses related to education and more engaging learning opportunities. Additionally, the adoption of OER fosters general improvements in the calibre and accessibility of education, so that institutions need to spend less on financial aid.

OER has been increasingly recognised as a cost-saving measure; furthermore, it has evolved as a powerful instrument for advancing social justice in education. OER addresses systemic inequities rooted in capitalist and colonial education structures (Lourenço et al., 2024). Nevertheless, the implementation of OER faces ongoing challenges, among which faculty resistance based on lack of awareness, misconceptions about the quality of the resources and established dependence on commercially published materials. Moreover, institutional inertia and the absence of firm policy mandates hamper widespread implementation efforts. Global experiences also show the presence of serious infrastructure constraints, cultural impediments to free sharing and coordination issues in policies (Datt & Singh, 2022). These hurdles affect, in particular, countries with limited education resources.

The effectiveness and stability of OER programmes need further investigation and more robust institutional collaboration frameworks. This study aimed to inspect OER through two fields of vision. The first vision was to determine how the OER concept evolved from 2002 to 2025 by identifying the greatest contributors to OER research globally according to country, affiliation, sources and collaborations. The second vision was to identify the most-cited articles, which laid the groundwork for current research on OER. To align the best definitions of OER, gold open-access articles were evaluated and the 100 most-cited documents were investigated to determine their footings.

1.1 Objectives of the Study

The major objectives of the study were:

1. To analyse the publication output and trends of OER using bibliometric analysis; and
2. To identify dominant themes and areas of inquiry using thematic analysis of the 100 most cited open-access OER research papers.

1.2 Research Questions

The study was centred on two research questions:

1. What are the research outputs on OER from 2002 to April 2025?
2. What are the foundational themes that papers on OER refer to?

2. Literature Review

In 2002, the UNESCO Forum set out for many earlier OER initiatives that undergone its implication in educational system (D'Antoni, 2009). OER refers to ubiquitous and openly available materials that can be used for the purposes of teaching, learning, research and development (Shukla et al., 2022). Grosseck et al. (2020) explains initiatives that utilise OER and portrays the growth and efficacy

OER brought to education. OER has the capability to enrich formal education and support self-learning and lifelong learning (Das & Mukherjee, 2023). Clinton-Lisell et al. (2021) describe OER as tool that can promote equity. OER promotes social justice by enabling instructors to adapt content and implement it in culturally inclusive teaching. Ndibalema (2024) analysed 911 publications on OER and tracked the rise in OER research as a result of the COVID-19 pandemic. Zancanaro et al. (2015) analysed publications on OER from 2002 to 2013 and point out the importance of OER for education.

Chandler (2023) tracked literature on OER and higher education from 2002 to 2022 and listed in Web of Science and identifies the contribution of OER in library and information science. Orzech et al. (2025), in a case study that analysed the OER journey of new and experienced instructors at a single institution, provides themes and contexts in relation to the practice of OER. These scholars conducted a post-project analysis of an international OER initiative and, through thematic analysis of interviews and documents in the case study, describe the role of OER in innovation and pedagogical change. In turn, this literature review unveils the shortage of analysis on OER and undertook a bibliometric and thematic analysis, using mainly resources published on the Scopus database.

3. Methodology

This study adopted a two-phase mixed methods approach that integrated bibliometric analysis and thematic analysis to comprehensively map the evolution pattern and intellectual structure of OER. The first phase of the study was the bibliometric analysis, which was used to map the evolution pattern and shifts in the structure of OER. Bibliometrics is a branch of the discipline of scientometrics (Ling et al., 2021), which is used to evaluate scientific output and scientific activities of particular research fields or a particular journal (Yu et al., 2017, 2018). Bibliometrics constructs a general overview of a scholarly discipline according to publications, journals and authors (Merigó & Yang, 2017). Bibliometric analysis is seen as a systematic way to quantitatively study large amounts of academic writing (Manoj Kumar et al., 2023).

With the help of statistical and computational tools, it examines details such as authors, institutions, citations and keywords of research papers, conference materials and books, thereby exposing hidden patterns, new trends, and connections in a research area (Ganti et al., 2025). This technique is useful for determining how much research is being done by individuals, institutions, or countries, how influential publications are, based on how often they are cited, and identifying who are working together. Furthermore, bibliometric analysis helps us understand the core ideas and relationships in a field by, for instance, analysing shared citations, references and keywords (Hassan & Duarte, 2024; Mishra et al., 2022).

Table 1: Search queries and the resulting number of documents in the Scopus database (Papić, 2022)

Search name	Search query	Date	Number of documents
OER	TITLE-ABS-KEY (("open educational resource" OR "open educational resources") OR ("OER" AND ("open educational resource" OR "open educational resources")))	10 April 2025	3 048

Bibliometric analysis is becoming ever more important for evaluating research, policymaking and strategising, because it provides useful information about how scientific fields develop and change. The study employed two software programs, VOSviewer and Bibliometrix (Aria & Cuccurullo, 2017; Van Eck & Waltman, 2010). Scopus stands as a major database for studies in the social sciences, particularly education. The scarcity of bibliometric studies relating to OER and covering the timeframe 2002 to 2025 for data in Scopus was one of the reasons for using Scopus as the major database of the study. Search strings applied and the number of documents generated are shown in Table 1.

The second phase of study involved thematic analysis. Thematic analysis is an accessible and flexible method of doing qualitative analysis (Braun & Clarke, 2006). Thematic analysis offers a structured method for analysing data and ensuring that the process is both comprehensive and clear. In thematic analysis, themes are derived from the data itself, rather than being imposed by the researcher (Skoglund et al., 2025).

Thematic analysis is known as a prevalent and versatile qualitative research methodology, particularly for the social sciences, psychology and education. It is characterised by methodological flexibility and systematic design, and can identify, richly analyse and meaningfully interpret recurring patterns or themes in any qualitative type of data, such as text, images and audio materials (Bauer & Gaskell, 2000; Lochmiller, 2021). Thematic analysis helps researchers explore new and creative meanings hidden behind data, which encourages a profound and context-sensitive understanding of phenomena under examination.

By undertaking the strict processes of coding and synthesising emerging themes, scientists are able to create new theoretical contributions or develop existing paradigms, thus advancing conceptual knowledge about complex phenomena (Khokhar et al., 2020; Naeem et al., 2023). The present study used manual coding as well as artificial intelligence (AI) assistants such as ChatGPT, Perplexity and DeepSeek in the open coding phase to facilitate comprehensive data extraction.

Then, the study proceeded to do selective coding and axial coding, which was done manually by analysing the open coded data. Thematic analysis provides crucial implications that inform the creation of effective policies (Sarshar et al., 2021). By placing the lived experiences and subjective perspectives of individuals at the centre, this method provides rich, evidence-based findings that can

contribute meaningfully to decision-making in a range of institutional and organisational settings. To align with OER values and facilitate reproducibility, the thematic analysis was limited to open-access (golden access) publications only. The schema for organising thematic analysis is given in Figure 1. The integration of the two methods enriched the meticulous scrutiny of the dataset.

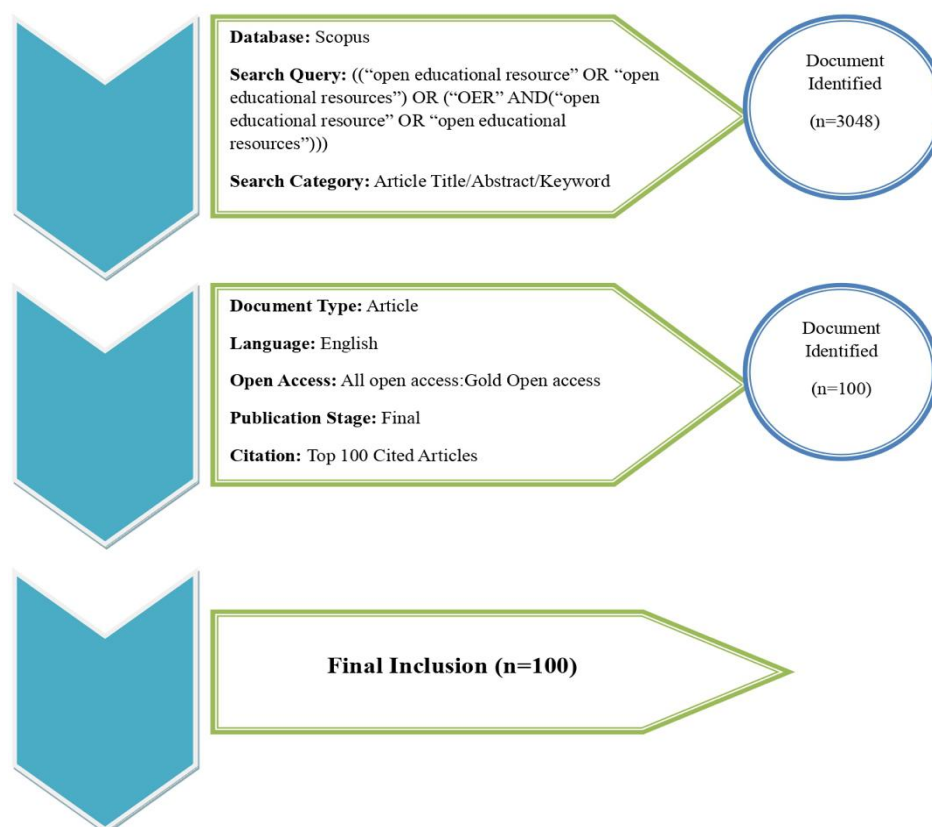


Figure 1: Article inclusion criteria

4. Results

The results section of the study comprises two sections. The first section provides the results of bibliometric analysis and the second, that of the thematic analysis.

4.1 Bibliometric Analysis

The analysis with the bibliometric method yielded results according to publications, sources, affiliations, countries, authors, collaboration and intellectual structure.

4.1.1 Annual Indicators of Publications

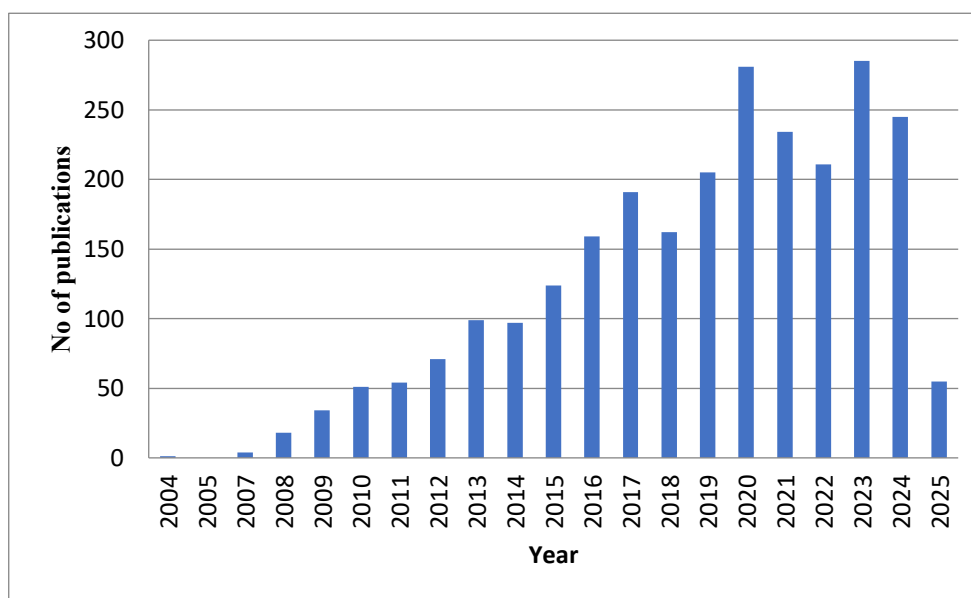


Figure 2: Number of publications in years (2004–2025)

Figure 2 tracks publications of research papers from 2004 to 2025. Between 2004 and 2006, there was little research published that specifically addressed OER, which indicates a nascent stage in academic explorations of OER topics. A gradual and steady increase in publications started in 2007, which marked the onset of growing scholarly interest in OER; from 2007 to 2017, the volume of publications continued to increase consistently, reflecting a sustained investigation of OER-related themes. A significant milestone was achieved in 2015, when the annual number of OER-related publications surpassed 100, signifying a broadening research base. A substantial surge in publication activity was observed in 2020, which coincided with the COVID-19 pandemic. Another increase in publication output occurred in 2023, which mirrors the high levels of 2020. In 2020 and 2023 the number of publications exceeded 250, indicating a renewed and intensified focus on OER.

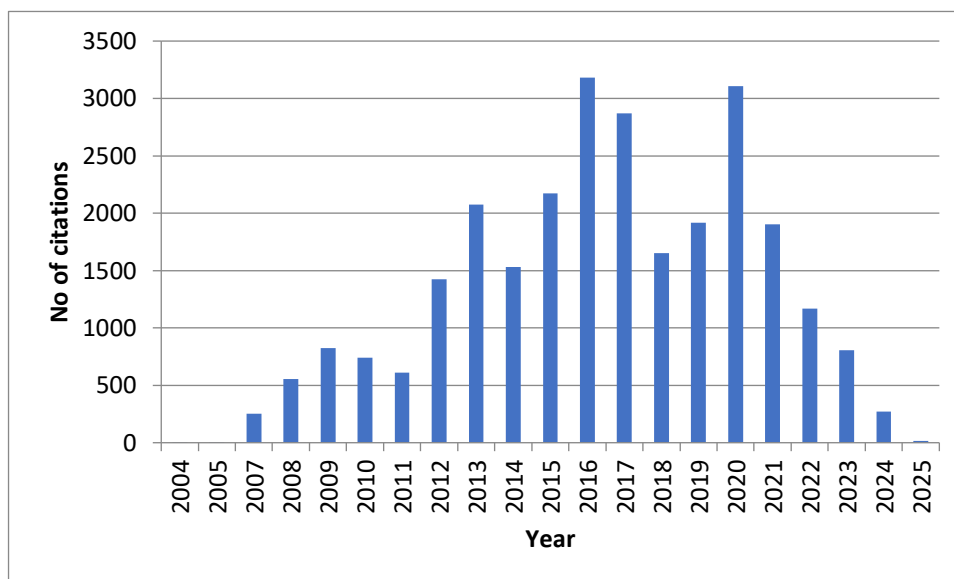


Figure 3: Number of citations by year (2004–2025)

Figure 3 graphs the number of citations, which shows an increasing trend from 2007. There was a remarkable jump in the number of citations in 2016, consistent with increased awareness of seminal works. The year 2020 demonstrated the same spike, at over 3 000 citations, reflecting, again, a year of academic activity. The period from 2013 to 2021 was characterised by substantial increase in citations, with most years surpassing 1 500, reflecting a sustained increase in scholarly impact. However, a decline in citation frequency occurred for the time period 2020–2024.

4.1.2 Types and Research Areas of Publications

Table 2 : Types of documents related to OER

Document type	Number
Article	1 366
Conference paper	780
Book chapter	301
Review	69
Book	23
Editorial	21
Note	14
Erratum	5
Letter	1
Short survey	1
Conference review	0

According to Table 2, the most prevalent type of document in OER research publications is articles, at 1 366. Conference papers accounted for the second-largest share, with 780 publications. Book chapters are the next category type,

with 301. Reviews that synthesise ideas and point out gaps in the literature contributed 69, followed by books as standalone works, with 23.

4.1.3 Distribution of Publications

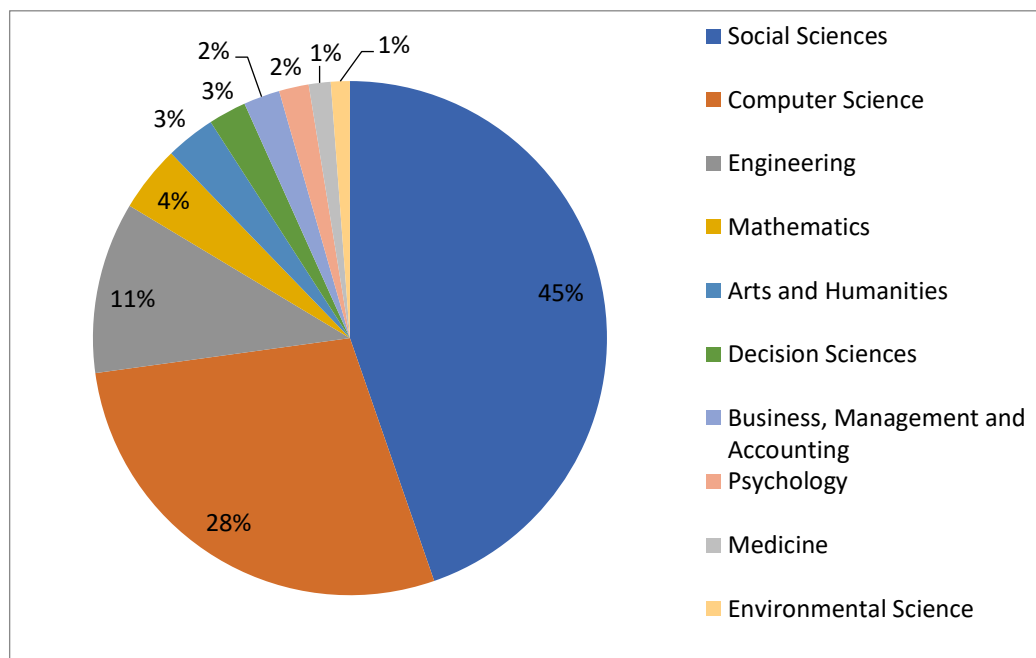


Figure 4: Distribution of OER research publications across top 10 disciplines

Distribution of OER research publications across academic disciplines, as illustrated in Figure 4, reveals a pronounced dominance by the social sciences, which represents the largest segment. Computer science is the discipline with the second-largest number of publications, although noticeably fewer than social sciences. Engineering follows closely, and business, management and accounting, while rendering fewer publications than the top three disciplines, still accounted for noticeable portions. Other disciplines, such as mathematics, arts and humanities, decision sciences, psychology, medicine, environmental science and energy, had much fewer publications.

Table 3: Ten most-cited publications related to OER

Rank	Title	Source	Type	Year	NC	AN	IN	CN
1	Ocean basin evolution and global-scale plate reorganization events since Pangea breakup	<i>Annual Review of Earth and Planetary Sciences</i>	Review	2016	867	12	3	3
2	Open educational resources and college textbook choices: a review of research on efficacy and perceptions	<i>Educational Technology Research and Development</i>	Article	2016	291	1	1	1
3	Chinese university students' acceptance of MOOCs: A self-determination perspective	<i>Computers and Education</i>	Article	2016	249	1	1	1
4	A review on massive e-learning (MOOC) design, delivery and assessment	<i>Proceedings – 2013 8th International Conference on P2P, Parallel, Grid, Cloud and Internet Computing, 3PGCIC 2013</i>	Conference paper	2013	229	4	2	2
5	Disrupted classes, undisrupted learning during COVID-19 outbreak in China: application of open	<i>Smart Learning Environments</i>	Article	2020	228	6	2	2

	educational practices and resources							
6	Open educational resources: Enabling universal education	<i>International Review of Research in Open and Distance Learning</i>	Article	2008	223	4	1	1
7	Openness and praxis: Exploring the use of open educational practices in higher education	<i>International Review of Research in Open and Distributed Learning</i>	Article	2017	198	1	1	1
8	Defining OER-enabled pedagogy	<i>International Review of Research in Open and Distributed Learning</i>	Article	2018	187	2	2	2
9	Giving knowledge for free: The emergence of open educational resources	<i>Giving Knowledge for Free: The Emergence of Open Educational Resources</i>	Book	2007	173	Not specified	1	1
10	An introduction to the inverted/flip ped classroom model in education and advanced training in medicine and in the healthcare professions	<i>GMS Zeitschrift für Medizinische Ausbildung</i>	Article	2016	164	12	6	2

Note. NC = Number of citations, AN = Number of authors, IN = Number of institutions, CN = Number of countries

The ranking of the 10 most-cited papers in the dataset, listed in Table 3, shows that the review paper, 'Ocean Basin Evolution and Global-Scale Plate Reorganization Events since Pangea Breakup', is the most cited paper. This review paper appeared in the *Annual Review of Earth and Planetary Sciences* in 2016. At 867 citations, it surpasses other entries by far, making it an obvious outlier regarding number of citations. This review is also remarkable for having the greatest number of contributing authors of all the most cited papers.

The next most-cited paper is another 2016 publication, an article, not a review. It had the second-highest citation count of 291. A number of papers published more than 10 years ago are in the 10 most-cited list. An example is a 2008 article published in the *International Review of Research in Open and Distance Learning*. Recent articles also appear on the list. An article published in 2020 in *Smart Learning Environments* is the most mentioned recent article in the top 10.

A more thorough look at citation trends reveals that 2016 was a significant year, because four of the 10 most-cited papers were published in that year. This dominance in the scholarly citation environment is supported further by the fact that the dominance signals a peak in influential research production in that year.

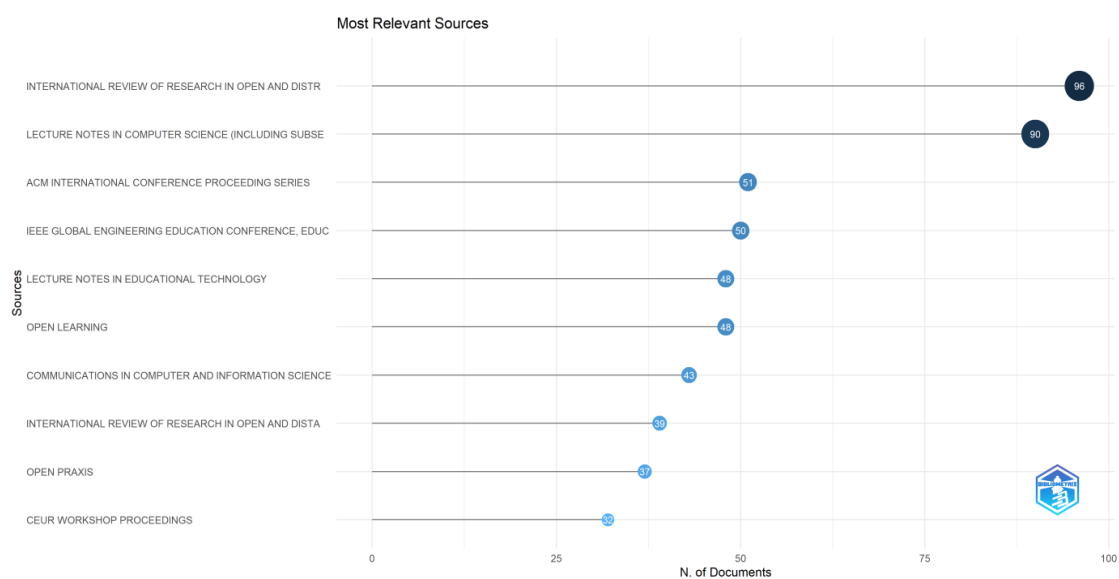


Figure 5: Most relevant sources

A small number of journals and publishers played a leading role in shaping the landscape of dissemination of research. As depicted in Figure 5, the topmost source is the *International Review of Research in Open and Distributed Learning (IRRODL)*, with 96 documents, pointing to its prominent contribution to publishing open and distance learning studies. *Lecture Notes in Computer Science (LNCS)* is a close second, with 90 documents. Other major sources are *ACM International Conference Proceeding Series* (51), *IEEE Global Engineering Education Conference (EDUCON)* (50), *Lecture Notes in Educational Technology* (48), and *Open Learning* (48). Publications in the middle tier that are also significant contributors are *Communications in Computer and Information Science* (43), *Open Praxis* (37), and *CEUR Workshop Proceedings* (32).

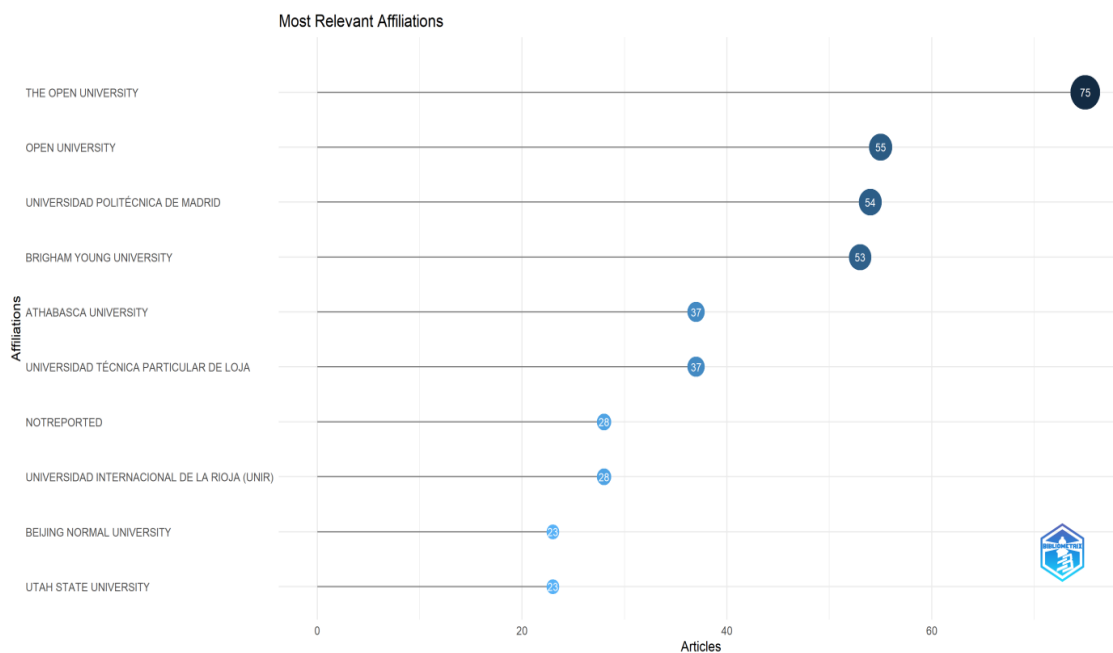


Figure 6: Most relevant affiliations

Figure 6 shows the author institutions with the most affiliations. The Open University is the top contributor, with 75 articles, thereby reflecting the high research output in distance learning of that institution. Next are Open University (55 articles), Universidad Politécnica de Madrid (54 articles), Brigham Young University (53 articles) and Athabasca University (37 articles). Other represented contributors are Universidad Técnica Particular de Loja (37 articles), Universidad Internacional de La Rioja (28 articles), Beijing Normal University (28 articles), and Utah State University (27 articles).

4.1.4 Country-Based Analysis

Table 4: Top 10 countries according to publication volume

Country	Number of publications
United States	793
Spain	325
United Kingdom	305
Germany	220
Canada	162
China	135
Brazil	126
India	112
Australia	104
Greece	88

The United States has a dominant position regarding number of publications related to OER (Table 4), with a total of 793 publications, which is approximately double the output of the second-largest contributor, Spain, which has 325 publications. Notably, four European countries – Spain, the United Kingdom, Germany and Greece – are represented among the top 10 countries according to number of publications, which emphasises the strong research presence of the continent in the field of OER. China and India are emerging contributors to OER research, though their output lags behind Western nations. A large disparity in publication volume of the first and tenth country, the United States and Greece, respectively, reflects the scale of research activity in the global OER community.

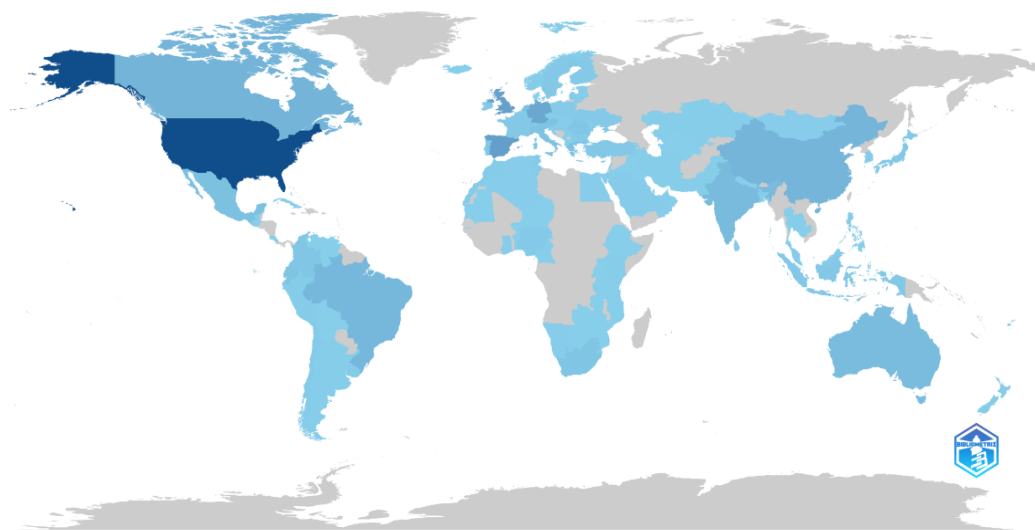


Figure 7: Scientific production by country

A global map that illustrates scientific production in OER (Figure 7) reveals a pronounced geographic skew, with research output concentrated in the global North, particularly in predominantly English-speaking countries. The United States stands out distinctly, represented by the darkest shade of blue on the map. Other countries, such as Canada, the United Kingdom, Germany, Australia, China, India, South Africa and Brazil are depicted in a medium blue, which indicates moderate to large contributions to the field. Most nations in Latin America, Africa and Southeast Asia are shown in pale blue, thereby indicating a growing yet still limited volume of research output. The countries shaded in grey, mostly in regions such as Central Asia, Middle East, Northern and Central Africa and Eastern Europe, indicate countries that have not made significant numbers of contributions to OER research.

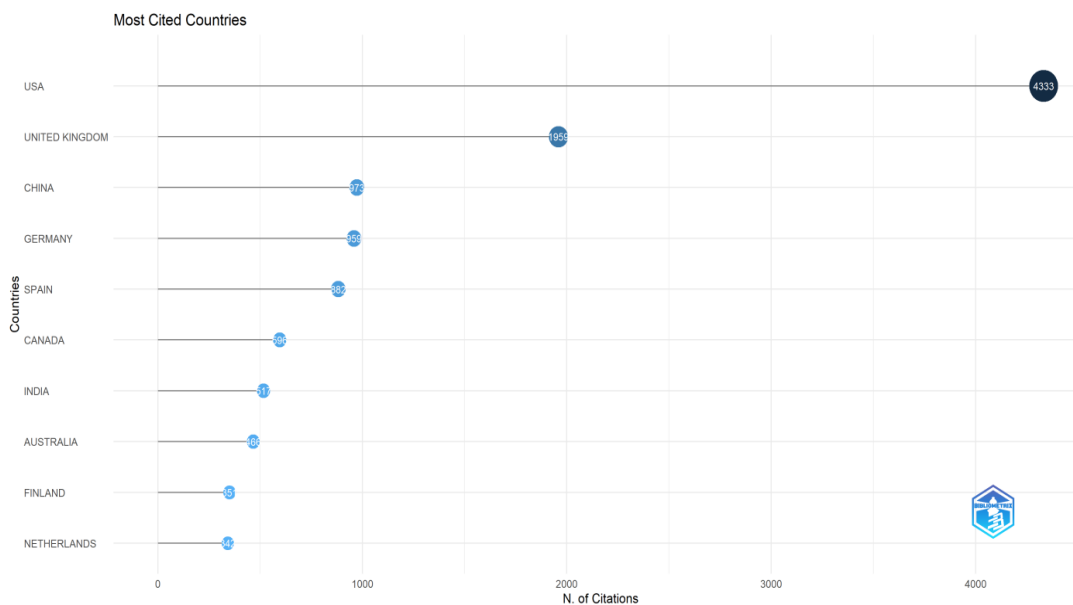


Figure 8: Most cited countries

The dissemination and impact of research in the flourishing field of OER exhibited a distinct global distribution, as evident in Figure 8, which shows a citation analysis by country. The United States leads with the highest number of citations, followed by the United Kingdom. The United Kingdom, Germany, Spain, Finland and the Netherlands represented a strong European presence in the domain of OER. China ranked third for citations. India also features in the top 10 and, when considered along with China, represents an Asian foothold in the field.

4.1.5 Co-authorship Countries

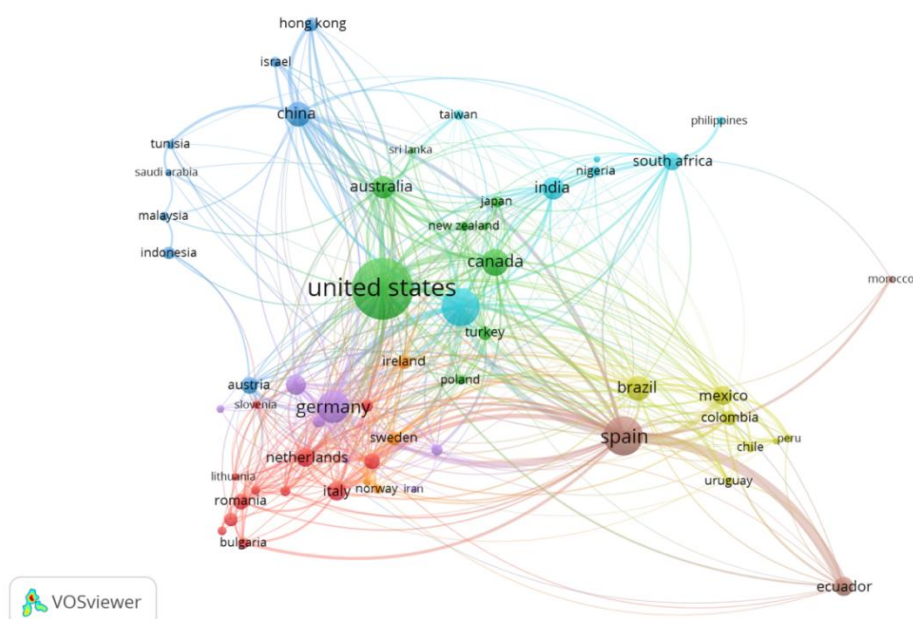


Figure 9: Country co-authorship collaboration network

Figure 9 is a VOSviewer co-authorship network map of country collaborations in OER research. The map was generated using fractional counting and applying a threshold of a minimum of 10 documents and citations per country. The mapping reveals the United States has the largest node, which conveys its broad OER research volume and collaborations and extensive international collaborations. Regional collaboration networks of European clusters, shown by links between Germany, Spain, the Netherlands, Sweden, Austria and Ireland, indicates regional research synergy. Transcontinental links are seen where the United States and European nations collaborate with Asia and Latin America. Countries such as Sri Lanka, Tunisia and Uruguay appear on the map, but have few connections, suggesting isolated efforts in research activity.

4.1.6 Co-authorship Authors

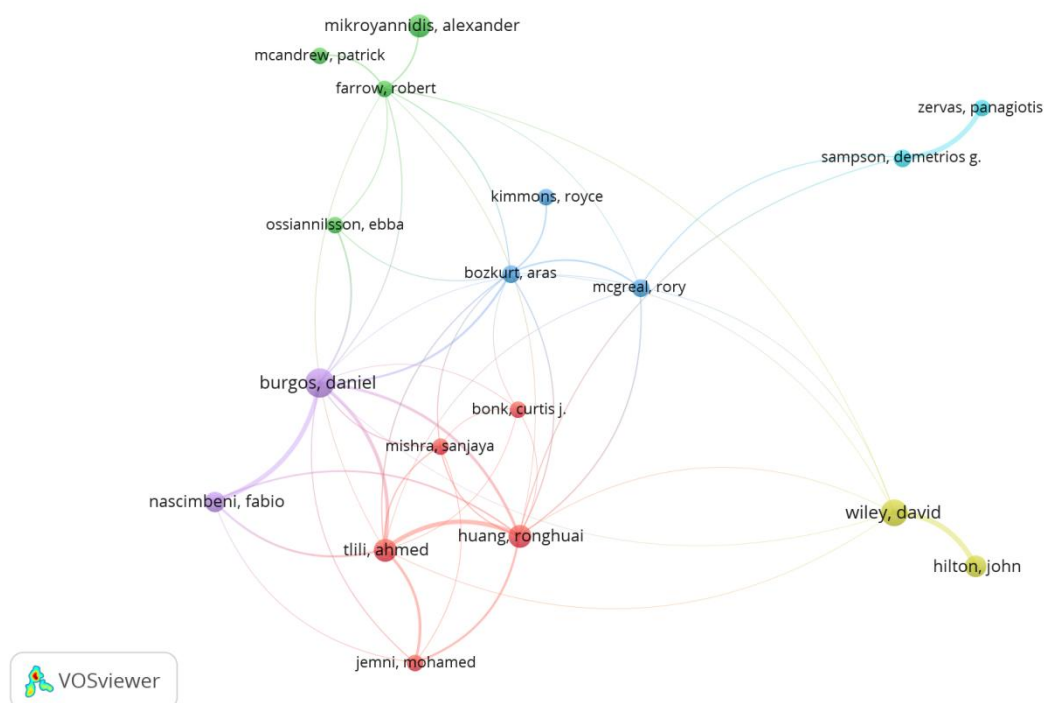


Figure 10: Largest connected network of authors

A social network analysis was conducted to map the collaborative relationships among authors in the field; this was done utilising fractional counting and applying a threshold of a minimum of 10 documents and 10 citations per author. Figure 10 shows the largest connected network of authors, the red cluster, represents the core interconnected network of authors, which includes Ahmed Tili, Curtis J. Bonk, Sanjaya Mishra, Mohamed Jemni and Ronghuai Huang. This cluster is characterised by dense network of collaborations. The purple cluster demonstrates significant connectivity with the red cluster.

Notable authors in this cluster are Daniels Burgos and Fabio Nascimbeni, who serve as bridge between red dots. The blue cluster includes scholars who are instrumental in facilitating cross-cluster interactions. The blue cluster, including

Araz Bozkurt, Rory McGreal and Royce Kimmons, indicate a hub of collaborations across clusters. The green cluster exhibits a distinct focus, with collaborative ties primarily internal to the group, and few external connections. Authors such as Alexander Mikroyannidis, Patrick McAndrew, Robert Farrow and Ebba Ossiannilsson fall in the green cluster. The yellow cluster contains David Wiley and John Hilton, who have strong collaborative ties, but with minimal external links to the other groups. Demetrios G. Sampson and Panagiotis Zervas are included in a smaller, but isolated cluster that is characterised by limited connectivity to a broader network. Notably, Rory McGreal, Araz Bozkurt and Daniels Burgos act as pivotal connectors and bridge multiple clusters and facilitate the flow of knowledge and collaborations across networks.

4.1.7 Co-occurrence Keywords

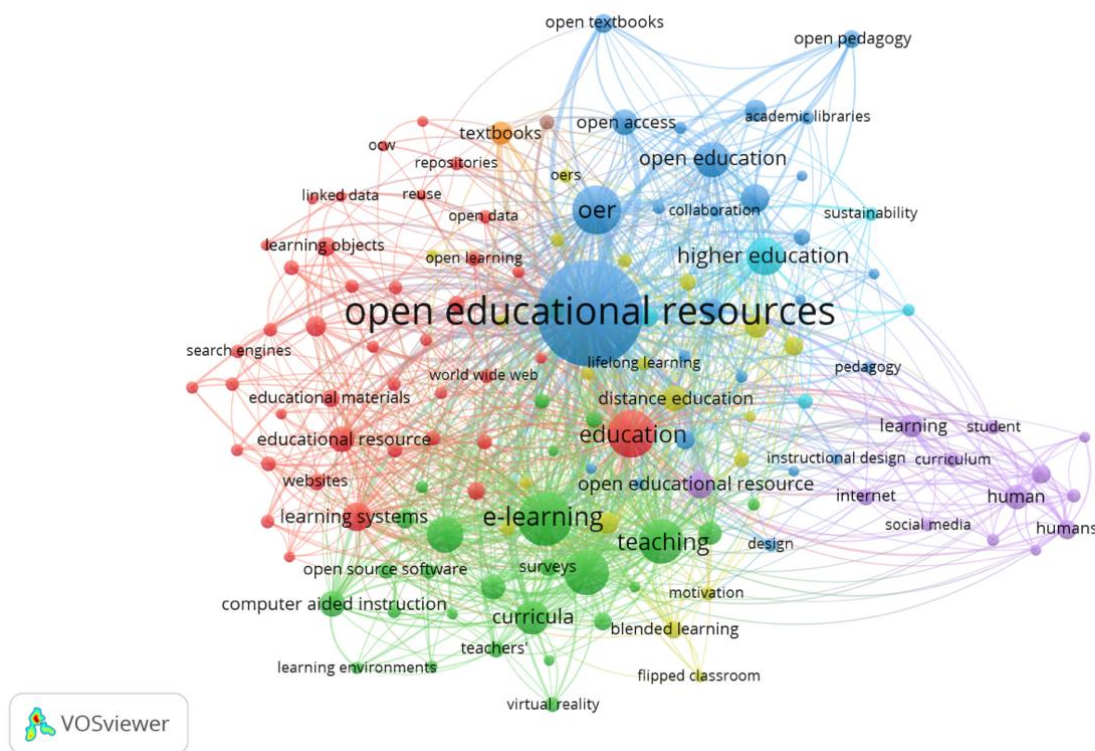


Figure 11: Co-occurrence network of keywords

Figure 11 illustrates the co-occurrence analysis of keywords by employing fractional counting and a threshold of 20 minimum co-occurrences per keyword. The analysis reveals six major clusters in the OER landscape. Cluster 1 involves a cluster of open education practices; the cluster is characterised by words such as open textbooks, open pedagogy, open learning and open education. This cluster often explores the transition from traditional classroom-based instruction to more flexible, open learning environments, thereby highlighting the transformative potential of open education.

Cluster 2 mentions OER repositories and access, with core keywords such as repositories, open access, education material, and educational resources. This

indicates that researchers examined how platforms store, share and distribute open resources by emphasising searchability, sustainability and institutional support. Technology-enhanced learning is the main topic of Cluster 3. Keywords such as learning systems, open-source software, computer-aided instruction and learning environments indicate the role of technology and reflect trends in digital education and software-supported instruction. Lifelong learning and curriculum-related matters are the topics of Cluster 4, with keywords such as lifelong learning, distance education, teaching and curricula, which suggest research on how OER supports flexible, nontraditional education pathways.

Cluster 5 is built on keywords focused on social and human factors, with core keywords such as student, human, social media and collaboration. This details learner-centric aspects and collaborative learning, by highlighting social dynamics of open education. Emerging trends and innovative delivery are emphasised by Cluster 6, of which virtual reality, internet and instructional design are core keywords. The cluster signals growing interest in immersive technologies and innovative OER delivery methods.

Keyword links reveal that the term higher education served as a bridge between the terms open pedagogy and repositories, thereby underscoring its centrality in OER research. The term learning appears in multiple clusters, signifying its broad relevance. Open educational resources, OER, education, e learning, teaching, curricula and learning systems are keywords with high density. Open education, open access, open textbooks, distance education, learning environments, blended learning, educational materials and educational resources are keywords with medium density. Open pedagogy, sustainability, virtual reality, flipped classroom, instructional design, internet, social media, search engines, repositories and linked data are low-density keywords.

4.1.8 Citation Co-occurrence Documents

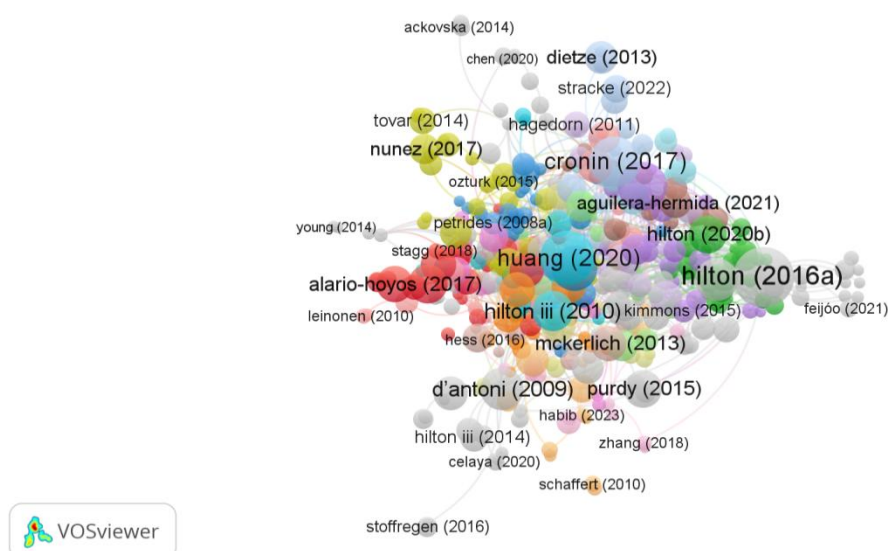


Figure 12: Citation co-occurrence pattern among documents

Figure 12 provides the citation network of documents with at least 10 citations and reveals that several nodes occupy central positions, thereby indicating a high degree of interconnectedness. Huang et al. (2020), Hilton (2016, 2020), Cronin (2017), and Aguilera-Hermida et al. (2021) have strong influence in the network. The cluster around D'Antoni (2009), Purdy et al. (2015) and Alario-Hoyos et al. (2017) are clusters that branch out from the central cluster. Other documents, such as Ackovska and Ristov (2014) and Mosquera Feijóo et al. (2021), appear on the periphery of the network, indicating that they are not widely connected to central documents. Huang et al. (2020), Hilton (2016) and Cronin (2017) are highly cited and influential publications in the dataset.

4.2 Thematic Analysis

Thematic analysis of the 100 most-cited gold access papers related to OER discloses 10 basic themes: Definition and scope of OER, Barriers in OER, Open educational practices, Policy and institutional support, Equity and inclusion, Technological integration, OER sustainability and funding, Impact on learning outcomes, Quality assurance of OER, Post COVID-19. Papers emphasising these themes were mostly explored under the gold access category of OER.

4.2.1 Definition and Scope of Open Educational Resources

To develop OER necessitated an explicit definition and strong regulation on revision and dissemination of the OER. The major studies referred to the definition of UNESCO by highlighting, in particular, the necessity for open licences for sharing and reuse (Huang et al., 2020). Reference to the 5Rs framework indicates that OER is legally available for anyone to adapt and remake (Wiley & Hilton, 2018). Nevertheless, variations in the interpretation of OER and absence of legal clarity between contexts presents difficulties (Zancanaro et al., 2015), which requires standardised policies and guidelines (Otto, 2019). While legal certainty is crucial, Cronin (2017) favours ethical pedagogical considerations in addition to legal openness. Together, these studies emphasise that a common understanding and a stable legal framework are crucial for legal clarification and resolving difficulties in the dissemination of OER. They form the basis for achieving the equitability, inclusivity and flexibility potential of OER.

4.2.2 Barriers Facing Open Educational Resources

Despite increased international support, the successful realisation of OER is confronted by serious and interconnected obstacles in various education settings, as emphasised by empirical research. Jung et al. (2016) describe differences in digital infrastructure and internet access, language issues (mainly English content than localised content), the absence of institutional policy and incentives, and pedagogical quality issues, as main hindrances for Asian nations. Bordoloi et al. (2021) confirm these hindrances in the Indian higher education sector and identify digital illiteracy, inadequate training, institutional resistance, poor policy integration, and inadequate funding as key barriers.

Research in Turkish higher education identified instructor unwillingness to share content, resulting from intellectual property issues, low awareness of open licensing, failure by institutions to acknowledge OER contributions, and

technical integration challenges (Kursun et al., 2014). If these observations are integrated, it is clear that the obstacles facing OER adoption are complex. These obstacles were enlisted as infrastructural shortcomings, weak policy, pedagogical resistance to change, and intellectual property rights. Addressing these obstacles required a holistic strategy centring on capacity development, legal studies, infrastructure building and institution-wide open education cultures, the achievement of which could bring about the full transformative value of OER for inclusive, sustainable education.

In spite of increasing international advocacy, mainstreaming OER on a large and effective scale faces hurdles. The main impediments result from convergence of ongoing challenges across cultural, institutional, policy, awareness, technological and systemic contexts. Cronin (2017) contends that legality alone is not enough. Ethical and pedagogical uncertainties, trust, academic freedom and digital literacy are decisive factors in adoption. This is affirmed by Kursun et al. (2014), who report that faculty resistance to sharing resources stems from intellectual property concerns, a lack of incentive for supporting faculties for the creation of OER, and low levels of knowledge regarding open licensing. Policy and structural loopholes also discourage OER uptake. Jung et al. (2016) and Otto (2019) report the absence of complete policy frameworks and strategic institutional backing, especially in developing countries where supportive governance frameworks, funds and acknowledgement are required.

Awareness and capacity gaps were core impediments. Mtebe and Raisamo (2014) documented an extensive lack of awareness and technical skills for accessing, adjusting or producing OER in sub-Saharan Africa. Braddlee and VanScoy (2019) documented corresponding discrepancies in professional development, even where resources were not a concern, which highlights the need for ongoing faculty training and peer mentoring. Technological and language limitations made these difficulties more acute. Jung et al. (2016) and Tang (2020) refer to restricted access to the internet, ageing ICT infrastructure and the prevalence of English-language resources as key constraints, particularly in Asian environments.

Tang (2020), furthermore, observes that the failure of culturally localised learning needs must be taken into account during OER design. Issues of recognition and incentivisation serve as powerful deterrents. Otto (2019) and Kursun et al. (2014) point out that the absence of academic reward for OER through promotion, sufficient funding or increased workload discourage faculty engagement with OER. Braddlee and VanScoy (2019) promote the integration of OER contributions in reward mechanisms for academics. Lastly, systemic and geopolitical inequities shape perceptions of OER. Sharov et al (2021) explain the role of political, historic and systemic education legacies in post-Soviet and Eastern European education that contribute to pessimism about OER, especially where centralised curriculum control remains the norm.

Together, these interrelated barriers highlight the complexity of mainstreaming OER. Resolving these issues requires multifaceted approaches that should

acknowledge cultural contexts, create enabling policies and foster awareness and capacity. Technological and linguistic constraints must be overcome. Offering proper recognition and incentives, and taking consideration of larger geopolitical and systemic considerations are pivotal to unlocking the full potential of OER for inclusive and equitable education.

4.2.3 Open Education Practices

The real power of OEP resides in its potential to promote pedagogic change. Wiley et al. (2017) set the scene for achieving this potential in their exposition of how the 5Rs of open content could support a paradigm that moved from passive use to active processing and contextual redesign. Cronin (2017) expresses an even wider vision. He describes OEP as dedication to openness across pedagogical approaches, partnership and clarity. He focuses on a spectrum of participation that demands reflection.

OEP clearly promotes learner empowerment and individualisation. Drexler (2010) explains how open networks and resources facilitate autonomous learning and the acquisition of critical digital literacy. Zhang et al. (2020) extended this model by investigating the potential of using AI and data analytics in the OEP environment. The potential lies in individualising learning experiences, which is accompanied by a warning to avoid data privacy and algorithmic bias. The core principles of OEP include collaboration, co-creation and inclusivity. Schmidt-Jones (2012) presents a real-world example of open content production by educators and the cooperative nature of adaptation.

Bozkurt et al. (2019), through a meta-synthesis, supports the value of learner agency, participatory approaches and context specificity to promote socially just and inclusive OEP. They state that OEP must cater for various learning needs and equity concerns. Systemic application and international viewpoints expose the wider implications of OEP. Moon et al. (2020) highlight the need for institutional and policy support, which should comprise faculty development and infrastructure in scaling up OEP initiatives. Bulathwela et al. (2024) examined the incorporation of OEP in national and global lifelong learning strategies and propose that this integration has the ability to advance sustainable development and global learning agendas.

4.2.4 Policy and Institutional Support

A theme illuminated by the research is that successful OER implementation requires a strong connection. Harmonious alignment of national policies, institutional strategies, and localised support infrastructures can promote strong implementation. Huang et al. (2020) point out the global need for formal governmental and institutional policies. Fulfilling these needs can bridge gaps and institutionalise OER in teaching practice through top-down strategies.

Likewise, Bordoloi et al. (2020) recognise that the absence of strong institutional support, and weak policy implementation, could be major barriers in higher education in India; they call for systematic policy articulation accompanied by funding and faculty incentives. Otto (2019) supports this demand by highlighting the necessity for a harmonised global policy environment that

includes legal frameworks, national repositories and cross-sectoral collaboration; in their view, scattered policies result in unsustainable initiatives.

Tang (2020) emphasises the incentivising role of institutions, in the form of structured promotion and recognition mechanisms to motivate faculty to use OER. These incentives link OER use to professional rewards. Promotion and recognition reflects a larger trend at universities, which involves rewriting their own stories. Universities create incentives so that faculty are rewarded for contributing to OER. Promotion and recognition resonates with the alignment of OER objectives with reward structures in academia. The case studies of Wright and Reju (2012) detail the successes of locally anchored capacity development and institutional backing, which are hampered by continued policy and funding shortfalls.

Ramírez Montoya et al. (2022) reiterate the need for strong institutional ecosystems that encompass digital literacy, leadership and enabling governance for OER success. Mtebe and Raisamo (2014) highlight how the absence of policy frameworks, and weak institutional support, lead to low OER adoption, and calls for explicit policies, training and funding incentives. UNESCO, in its draft of 2019, advocates for national OER policies and capacity building by member countries in support of Sustainable Development Goal (SDG) 4 to advance inclusive and equitable education through global partnerships (Miao et al., 2019). McGreal (2017) established the connection between OER and SDG 4 by claiming government policy action is crucial for guaranteeing education equity through OER.

4.2.5 Equity and Inclusion

This theme captures the multidimensionality of developing, deploying and maintaining inclusive practices in open education spaces across the globe. A number of dominant themes surfaced as essential for realising equitable access and participation. Student-centred design and contextual salience are emphasised as pivotal to widening participation. Bulathwela et al. (2024) refer to customisation and cultural flexibility, particularly for marginalised people in the global South. They specify the importance of creating localised content and ensuring community adaptation. Overcoming the obstacles to inclusion, such as access to technology, digital competence and institutional readiness, is vital.

Huang et al. (2020) call for policy contexts that integrate inclusive approaches, such as universal design for learning and fair access to digital infrastructure, regarding which there are massive global disparities. Bordoloi et al. (2020) confirm these issues in the higher education context in India, thereby highlighting the presence of a digital divide by gender, socio-economic status and rural-urban location. They call for systemic change in the form of the provision of training to use devices to improve digital literacy, and localised support.

In addition to access, inclusive pedagogical practices need to be applied to actively involve underrepresented groups. Gownaris et al. (2022) highlight

community-based learning, co-creation of knowledge and empowering learners' voices for epistemic justice. The resource of Ramírez Montoya et al. (2022) prioritizes open licensing and local language content to promote inclusion in linguistically diverse and technology-poor environments. The localisation should be complemented by teacher training and institutional capacity. In response to the needs of diverse learners, Nusbaum et al. (2020) call for inclusive course design that is integrated with assistive technologies, adaptable assessment and an inherent ethos of accessibility, which would make courses universally accessible and supportive of neurodiversity.

A meta-synthesis by Bozkurt et al. (2019) mentions equity as a recurring issue in OER and MOOCs (massive open online courses); true access is hindered by barriers relating to digital literacy, language and cultural relevance. To address these hindrances, the study suggests participatory design, regional collaboration and learner support. Supportive policies at several levels are critical to systemic change. Sharov et al. (2021) examined the digital transformation in Russian higher education and identified socio-economic stratification and uneven institutional capacity as problems. Their study advocates for multilevel policies that balance national investment, and institutional equity that targets learner support.

4.2.6 Technological Integration

Technology integration is a central theme in current OER research activities. Fostering learning in different domains through the power of technology was stressed, mainly by research papers. Diwan et al. (2023) referred to the employment of mobile applications and AI-powered platforms to open up access to OER in environments with a scarcity of resources, which indicates the application of adaptive learning systems for personal content delivery. Li and Zhao (2021) discuss the advantages of cloud computing in the management and distribution of OER, by highlighting how cloud computing could ease access, scalability and inter-institutional collaboration. Mosquera Feijóo et al. (2021) examined the influence of gamification and interactive media on student engagement and motivation to use OER, specifically in language and STEM (science, technology, engineering, and mathematics) education.

Drexler (2010) offers a conceptual framing for personal learning environments, which are supported by technologies such as blogs and social networks, that are moving in the direction of learner-centric use of OER. Moon et al. (2020) explored the effect of mobile learning and pervasive computing on OER uptake and report increased accessibility, particularly in the developing world and regarding the scope of context-sensitive personalisation. Zhang et al. (2020) explored the use of AI to recommend and curate OER, thereby demonstrating the value of smart and personalised learning sequences. Li and Zhao (2021) discuss the important issue of digital rights management for OER which could be done by using blockchain technology to provide content integrity and develop trust in open environments.

4.2.7 Sustainability and Funding of Open Educational Resources

The success of OER ventures is dependent on developing flexible and context-specific frameworks. These frameworks, influenced by institutional purpose,

resource allocation policy and stakeholder involvement, can ensure sustainability. Early developmental stages tended to rely on grant funding and institutional support for creation and revision of OER (Wiley et al., 2012). While acknowledging the one-time nature of such support for the initial stages of preparation of OER, Wiley et al. call for a shift towards recurrent budgetary appropriations or revenue-generating initiatives to ensure long-term sustainability of such OER. Ikahihifo et al. (2017) suggest a cost-saving and reinvestment approach that would channel monetary savings generated from OER implementation strategically to reward faculty and fund course redesign, thereby creating to a self-perpetuating cycle.

Faculty participation, a key component of sustainability, is discussed by Baker (2019), who makes the case for integrating OER development and use in institutional reward structures such as tenure and promotion. Arimoto et al. (2016) highlight multi-stakeholder partnerships in their OER programme. The partnership includes collaboration with universities, governments and private institutions. In addition, government policy will serve as a catalytic factor in financial planning and institutional take-up.

To solve the infrastructural issues of OER sustainability and ensure long-term access and upkeep, Wiley et al. (2012) recommend robust, scalable digital repositories financed by consortia or public-private partnerships. Annand (2015) describes several strategic financial models, including subscription-based services, endowment funds and licensing of ancillary services, to create recurring income and minimise dependence on grants. Bordoloi et al. (2020) synthesise these views and advocate for OER to be integrated in national education policy and institutional strategic planning at the systemic level. They focus on the need for alignment among academic, administrative and financial spaces to assure continued impact and growth.

4.2.8 Impact on Learning Outcomes

The use of OER and associated pedagogical innovations can have a significant impact on student learning outcomes in various learning environments. Scholars suggest better student engagement, greater ease of access to content and improved academic achievement as significant benefits. Key research by Wiley and Hilton (2018) indicates that, in the case of achievement, students who used OER performed as well or better than students who used regular textbooks. The cost-effectiveness of OER improved sustained access to course material, which, in turn, maximised learning effectiveness.

Wiley et al. (2012) point to the pedagogical benefit of 'open pedagogy'. Student participation in the production and modification of OER promotes a rich understanding and increases higher-order cognitive abilities, thereby increasing ownership and engagement. Schmidt-Jones (2012) report that self-directed learners with flexible, modular OER materials exhibited superior understanding and retention - better than that of students who employed inflexible formats. Diwan et al. (2023) describe how AI-driven adaptive learning systems that provided customised OER materials resulted in improved assessment

performance. This finding indicates that technology maximises the pedagogical potential of OER by enabling personalised targeting for self-directed learners. Finally, Drexler (2010) posits that personal learning environments that involved students curating and interacting with digital content, including OER, increased motivation, engagement and critical thinking, which eventually influenced learning outcomes.

4.2.9 Quality Assurance of Open Educational Resources

The quality assurance of OER is a fluid and context-specific process that is determined by institutional structures, technical specifications, faculty attitudes and pedagogic practices. Jung et al. (2017) stress user-centricity in Asian countries by underlining the importance of engaging both institutional groups and individual teachers in thorough evaluation parameters, including content accuracy, pedagogic merit, technical ease of use and availability. They also acknowledge regional differences in quality standards. Arimoto et al. (2016) found a disconnect between policy support for OER and actual application by instructors, which indicates that poor quality assurance originates from insufficient supportive mechanisms such as training, appreciation and specific benchmarks, moderated by academic culture and institutional preparedness.

Kursun et al. (2014) highlight faculty concerns in the Turkish context over the credibility and reliability of open content, which result from reservations regarding peer-review status and validity. Such faculty concerns emphasise a necessity for standardised and transparent quality assurance processes to establish trust among academic users. Moving the discussion to open pedagogy, Wiley et al. (2012) hold that the quality of OER is immanently connected with its applicability and flexibility. These scholars suggest using a community model in which quality assurance is woven in a spiral process of design, feedback and revision, and which draws on user contributions to ensure ongoing improvement instead of a one-time assessment.

4.2.10 Post COVID-19 Pandemic

This theme considered the far-reaching effects of the COVID-19 pandemic on tertiary education, and refers to increased digitalisation, longstanding equity concerns, and the need for future-proof resilience – topics that are explicated in various papers (Bordoloi et al., 2021; Ramírez Montoya et al., 2022; Zhang et al., 2020).

The sudden transition to remote learning when COVID-19 broke out highlighted faculty difficulties with digital pedagogy and exposed an urgent need for systemic assistance (Bordoloi et al., 2021). The shift, which Zhang et al. (2020) posit as offering both challenges and opportunities, probably solidified blended learning and adaptive technologies as permanent aspects of higher education. Ramírez Montoya et al. (2022) report that this change involved not only a technical transformation, but signified a wider organisational transformation that demanded agility, data-driven decision-making and collaborative ecosystems, which all forced institutions to align their strategies with digital imperatives.

The swift digitalisation intensified existing equity and access issues. Bordoloi et al. (2020) and Zhang et al. (2020) emphasise wide digital divides that affected rural and disadvantaged students. This wide digital discrepancy results from inequalities in technology access, internet connectivity, and digital competence. The study emphasises the importance of integrated pedagogical and psychological support in addition to technological arrangements. Even before the pandemic, Braddlee and VanScoy (2019) had anticipated the increasing emotional labour being endured by instructional support staff; this prediction proved accurate.

Pandemic-era research referred to increased faculty stress, burnout and workload disparities. For the future, Ramírez Montoya et al. (2022) and Zhang et al. (2020) highlight the necessity for agile, adaptable and inclusive innovation to craft institutions that are ready for the future. The crisis of the pandemic accelerated cross-sector collaborations and reshaped leadership positions. It promoted the integration of digital skills into institutional DNA in order to sustain and evolve despite disruptions that the future holds.

In short, the pandemic acted as a key motive for swift digital change in higher education. It exposed the serious equity issues of online learning. To build institutions to withstand future disruptions there is a need to look beyond new technologies. True resilience requires organisational transformation and a profound commitment to equity and access, and a renewed focus on supporting the well-being of the educators at the heart of education.

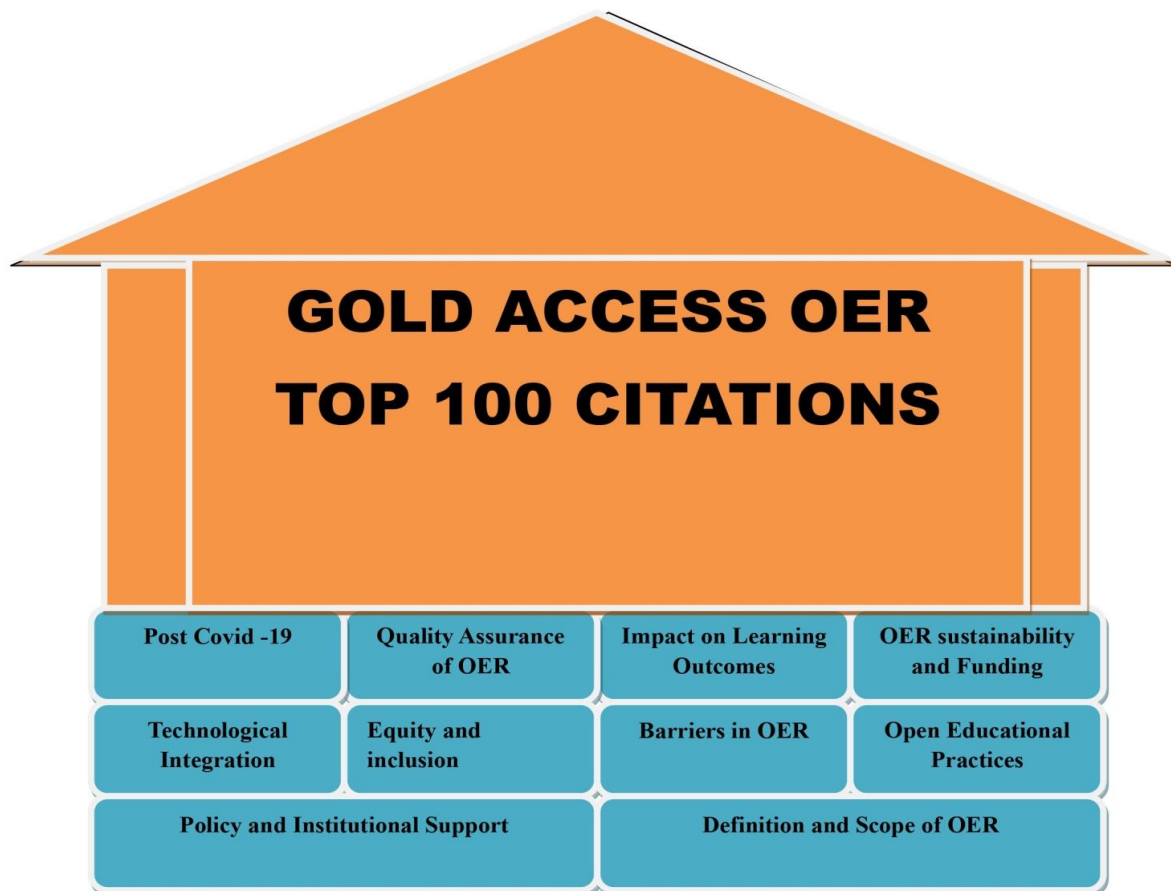


Figure 13: Visualisation of themes identified by thematic analysis of 100 most-cited gold access articles

4.3 Analysis of Specific Codes

Thematic analysis using specific codes was also undertaken to do a deep exploration of the themes. The codes used were Sample, Type of OER, Methodology, Technology integration, Competency OER, Microlearning OER, Lifelong learning OER and Study perspective. The codes were used to investigate the studies deeply and analyse the themes.

Most of the work (around two-thirds) were focused on tertiary education settings, with a concentration on teachers and students at universities. This concentration emphasises the critical role of the higher education sector in the use and application of OER. It also captures the relative absence of focus on other educational environments such as K-12, vocational training and informal learning environments. In content terms, the most commonly examined OER forms were open textbooks, multimedia materials and MOOCs, which mirrors ongoing dependence on conventional forms of learning.

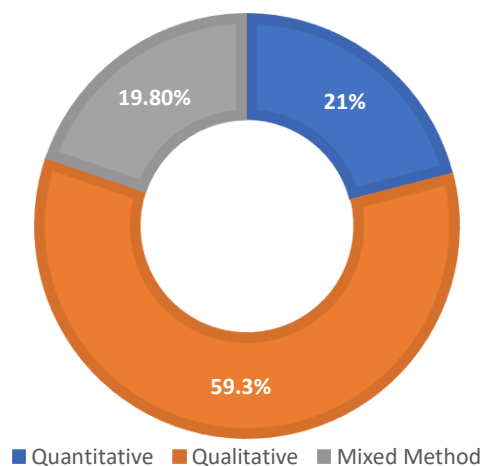


Figure 14: Methodologies used by studies

The distribution of methodologies used by studies represented in Figure 14 indicates that most studies had used qualitative methods – about 59.3% of studies were qualitative, while only 21% of studies used a quantitative method and 19.8% studies used the mixed method approach.

More adaptive and interactive OER tools seemed underrepresented in the literature. This indicates an area ripe for further research and innovation. In addition, technology integration was described by more than half the studies in relation to systems such as learning management systems and digital repositories such as OpenStax or OER Commons. Of the described systems, video delivery services were the most commonly mentioned. However, new technologies such as mobile learning applications, adaptive learning algorithms, and AI-driven instructional design were scarcely investigated.

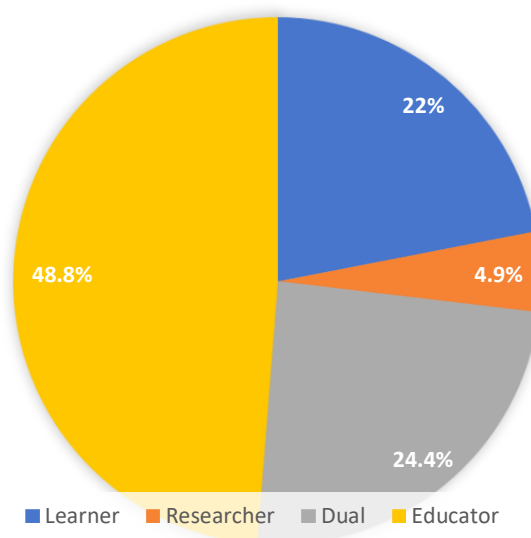


Figure 15: Distribution of research perspectives in 100 most-cited gold access OER studies

Regarding distribution of perspectives on OER (Figure 15), most studies (about 48.8%) were focused on educators. A further 22% and 24.4% studies had a dual perspective, focusing on both the learner and the educator, and a learner perspective, respectively. Even though pedagogical innovations continued to increase, competency-based OER received little attention. Some research noted the promise of modular and outcomes-based learning with OER, but there was a lack of empirical research testing of such models.

Similarly, microlearning, which is a model that fits well with digital content presentation and modern learner preferences, was hardly mentioned. This means breaking down OER into chunks and delivering it at that right pace is still underexplored. A relatively small proportion of studies (about 20%) claimed that the promotion of lifelong learning was an advantage of OER, yet thorough analyses of how OER facilitated lifelong learning pathways could not be found.

Overall, the analysis suggests that the core fields of OER, such as open licensing, access and cost savings, were richly covered in the literature, but the domains of technological innovation, personal learning strategies and lifelong learner activity were underserved. The findings suggest that OER research had matured in certain areas, and that there was a need for diversification and extension of methods in future work.

5. Discussion

The study found that OER research had experienced significant growth since 2007, when publication output started showing a steady increasing trend. Output is characterised by peaks in 2020 and 2023, when over 250 publications appeared. This confirms the OER research output reported by Mishra et al. (2022), and the similar wave in 2023. These spikes coincided with increased academic interest in OER that was driven significantly by worldwide education disruptions by the COVID-19 pandemic. The focus of the academic community on the COVID-19 pandemic disrupted other research (Papić, 2022); citation analysis reflected this change in course.

The discipline that dominated research was social sciences, with considerable inputs from computer science and engineering, which reveals the interdisciplinary characteristic of OER research. The most cited publication is a 2016 review, 'Ocean Basin Evolution and Global-Scale Plate Reorganization Events since Pangea Breakup', which had 867 citations. It stood out as a significant outlier in terms of citation impact. Regarding publication outlets, the *International Review of Research in Open and Distributed Learning (IRRODL)* produced the most publications, with 96 (Mishra et al., 2022; Papić, 2022; Zancanaro et al., 2015a). It was also an important medium for scholarly discourse in the field of OER.

On an institutional level, The Open University reported the strongest output in terms of number of publications (Papić, 2022). The sheer domination of this institution is based on its commitment to researching open and distance learning for over two decades. In terms of countries, the United States led for number of publications (793) (Papić, 2022) as well as aggregated citations, thereby showing

its leadership in the context of OER research. Geographical examination demonstrated a clustering of research activity in the global North, and by mostly English-speaking nations. There were relatively few contributions from areas such as Central Asia, sub-Saharan Africa, and much of Latin America.

Collaboration network analysis identified the United States as the most central and globally linked nation on this research topic. Scholars in the United States were involved in strong research collaborations with scholars in Europe, Asia and Latin America. Author-level analysis indicates a tight network of researchers, with Ahmed Tili, Curtis J. Bonk and Sanjaya Mishra in central positions, and bridging figures such as Rory McGreal and Daniels Burgos who connect research clusters to each other. Keyword co-occurrence analysis emphasised the core themes of OER research. Terms such as open educational resources, higher education and learning were prominent. Citation network analysis verified the foundational role of highly cited publications by Huang et al. (2020), Hilton (2016, 2020), and Cronin (2017), which constitute the intellectual foundation of the discipline. This bibliometric study identified the ongoing necessity to develop greater global involvement and collaborative efforts to promote the field of study of OER further.

The thematic analysis formulated 10 basic themes in the 100 most-cited gold access articles. Most OER studies were directed at tertiary education and specifically targeted university students and instructors. There was less concern for K-12, vocational training and informal learning. Traditional OER formats, such as open textbooks, multimedia, and MOOCs were the topics of most studies. Responsive and interactive resources were under-studied. Qualitative research prevailed (59.3%), with fewer quantitative (21%) and mixed method (19.8%) studies. Integration of technology, particularly learning management systems and digital repositories, was prevalent, while new technologies such as mobile applications and AI tools were seldom researched.

Research focus was primarily on educators (48.8%). Fewer studies focused on learners or were dual-focus studies. Pedagogical innovations such as competency-based education and microlearning were scarcely researched empirically. Despite this, there was some recognition, by 20% of the studies, that OER had tremendous potential for promoting lifelong learning, though extensive investigation in this field was insufficient.

6. Limitations and Future Opportunities

The study used bibliometric analysis and thematic analysis to investigate the topic. A bibliometric study was conducted in the Scopus data base only. Thematic analysis was conducted of 100 most-cited journals, specifically gold open-access versions. These limitations channelled the study in a specific direction and yielded distinct findings. This study adopted a specific and targeted approach, rather than presenting a broad overview. The setup of study was in a particular, defined setting. Bibliometric review of Scopus-covered OER publications provided a foundation for the detection of under-investigated studies, documents, geographic voids and patterns of collaboration. It provided a

way to expand the global and cross-disciplinary comprehension of OER. The thematic content analysis of popular gold open-access articles identified research directions and frameworks, which made longitudinal investigation of the development of OER discourse possible.

Underexplored domains such as adaptive learning, mobile integration, microlearning, and lifelong learning paths need to be investigated more empirically. Subsequent studies could investigate the real-world effects of OER adoption in various learning environments, especially non-tertiary and informal ones. The methodological focus that was identified implies potential for additional mixed method and data-informed research to enhance the body of evidence.

7. Acknowledgement

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8. Conclusion

This bibliometric analysis examined the academic landscape of OER research between 2004 and 2025. By tracing publication trends, influential works, dominant institutions and countries, collaborative networks highlighted a dynamic academic domain. The major themes paint a picture of a vibrant and maturing field. OER research peaked after the outbreak of COVID-19 pandemic, even though adaptation and utilisation of OER research was notable even before the outbreak. The pandemic provided an avenue for attracting more learners to learn using OER. The present study identified the documents, authors, subjects, regions, collaboration and co-occurrence in the field of OER that were at the forefront.

Foundational themes in OER were analysed by assessing the 100 most-cited golden access documents. It provided an eagle eye to identify the woven threads of the core ideas of most of the research papers. The analysis, using specific codes, extracted certain data from the cited studies to inform future researchers of gaps that require their attention. Overall, the study inspected the trajectory of OER studies, with a focus on the rooted themes. Bibliometric analysis followed the trends of OER research and thematic analysis identified the conceptual building blocks of OER studies.

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