Volume: 11 Issues: 83 [June, 2026] pp. 861 - 882
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: academicinspired.com/jised
DOI: 10.55573/JISED.118371

MAPPING RECENT TRENDS IN OPEN SCIENCE IMPLEMENTATION: A BIBLIOMETRIC ANALYSIS OF ACADEMIC PRACTICES FROM 2021 TO 2025

Mohamad Salbihan Salman[1*]

[1]Perpustakaan Universiti Sains Islam Malaysia, MALAYSIA
*Corresponding author: salbihan@usim.edu.my

Article history
Received date : 12-4-2026
Revised date : 13-4-2026
Accepted date : 14-5-2026
Published date : 30-6-2026

To cite this document:
Salman, M. S. (2026). Mapping recent trends in open science implementation: A bibliometric analysis of academic practices from 2021 to 2025. *Journal of Islamic, Social, Economics and Development (JISED),* 11 (83), 861 – 882

Abstract: *The goal of this study is to conduct a bibliometric analysis of Open Science Trends scholarly endeavors for academic and research institutions from 2021-2025, through looking at the 367 of publications published in the Web of Science Core Collection.data. Co-authorship networks, keyword co-occurrence (similarity), institutional collaboration and citations patterns were mapped using VOSviewer. Although interest in open educational resources and principles of FAIR approaches is increasing, the top-level themes are still calculated as open access, research data management/exchange workflows and citizen science. The most productive output on Spanish, German and Brazilian relatively low level of in the fragmented institutional collaboration. Strong Open Science connections identified by keyword mapping among academic libraries, data sharing and transparency. Citation analysis reveals a core set of influential published works addressing policy, stakeholder engagement, and data stewardship. The findings underscore the worldwide dialogue on openness, indicating that engagement in Open Science remains deficient in developing regions, with minimal cross-institutional collaboration. This study provides insights for the prompt involvement of librarians, researchers, and policymakers in enhancing Open Science practices focused on cooperation, infrastructure, policy frameworks, and governance. It also demonstrates the significance of VOSviewer and analogous bibliometric tools in representing the intellectual framework of research and guiding strategies for the future advancement of a more inclusive and equitable Open research system.*

Keywords: *Open Science; Bibliometric Analysis; VOSviewer; Institutional Collaboration; Research Data Management*

Volume: 11 Issues: 83 [June, 2026] pp. 861 - 882
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: academicinspired.com/jised
DOI: 10.55573/JISED.118371

Introduction

Open Science is revolutionizing the world's research ecosystem through the unprecedented availability of research processes, data, and findings, while emphasizing transparency, collaboration, reproducibility, and interdisciplinary cooperation. It is not limited to the publication of research works; rather, it includes open data and peer review, citizen science, open methodologies, and even open-source tools. Perhaps the most impactful aspects of the movement are the increasing opportunities for knowledge democratization, public accountability on research funded by taxpayers, and overall enhancement in the quality, impact, and trust in science (Fecher & Friesike, 2014; Tennant et al., 2016; Vicente-Saez & Martinez-Fuentes, 2018).

Literature Review

The advances in information and communication technologies (ICTs) have enabled the implementation of many practices of Open Science. The emergence of preprint servers, institutional repositories, and even the OSF and GitHub provides instant access to manuscripts, datasets, protocols, and codes which speeds the communication of science as well as transparency and interdisciplinary cooperation (Allen & Mehler, 2019). More policy and institutional support for such practices are demonstrated by the global initiatives as the European Open Science Cloud (EOSC), Plan S, and UNESCO's Open Science Recommendation (European Commission, 2016; UNESCO, 2021).

The importance of bibliometric analysis is its utility in providing a systematic and quantitative method for examining scientific development in terms of scholarly output, collaboration, citation practices and thematic progression. Analyzing bibliographic metadata such as publication and citation counts, co-authorship networks, and keyword co-occurrence (Donthu et al., 2021) enables researchers and policymakers to map the progression of scientific disciplines, assess critical contributions, and assess emerging areas of research. When placed in the context of Open Science Sugimoto et al. (2017) reveal that bibliometric methods have specific advantages in monitoring the "open" practices adoption curve, evaluating the impact of those practices, and showing participation gaps from different parts of the globe.

Problem Statement

Although Open Science as a research domain is growing, but there are still gaps in knowledge. Most of the literature has been theoretical or focused on Western Europe and North America, leaving very little evidence of practical implementation, especially in the context of institutional repositories or in non-Western countries. The lack of deeper studies analysing how governance, policy, infrastructure and other structures amplify or impede adoption is also apparent. Such gaps highlight the need for more targeted research driven by comprehensive global bibliometric datasets.

Objective and Scope

The aim and objective of this study is to systematically map and analyse the research landscape and thematic evolution of Open Science literature, drawing exclusively on publications indexed by the Web of Science Core Collection. Specifically, aims are to:

i. Identify publication trends and leading journals, countries, and institutions in Open Science research;
ii. Analyze patterns of scientific collaboration at author, institutional, and national levels;
iii. Map thematic structures and evolving research topics through keyword analysis;
iv. Assess the citation impact of core publications, authors, and journals;

Volume: 11 Issues: 83 [June, 2026] pp. 861 - 882
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: academicinspired.com/jised
DOI: 10.55573/JISED.118371

v. Examine the influence of research policies, technological infrastructures, and societal demands on the growth of Open Science.

For the purpose of this study, the author includes peer reviewed articles as well as reviews and conference proceedings published in English to ensure data accuracy. Moreover, the timeframe for inclusion was set to the last five years to ensure that the data reflects recent trends.

By achieving these objectives, this research provides actionable insights for researchers, librarians, institutional policymakers, and funding agencies, supporting strategic decision-making for the further promotion of transparency, accessibility, and collaboration in scientific communication.

Methodology

Data Source

The bibliometric data was retrieved from the WoS Core Collection, which a premier multidisciplinary database accepted as offering the most complete and rigorously curated bibliographic records (Falagas et al., 2008; Mongeon & Paul-Hus, 2021). This argument is partly based on the evidence that WoS has a limited bias by not covering regional journals or non-English publications which are sometimes available through other database such as Google Scholar or Scopus, but using with another one was avoided in this case for methodological reasons ensuring data consistency. WoS was used because extracting strict data such as authorships information like author, controlled keywords, institutional affiliation and thematic citation is more straightforward for WoS other than Scopus. This normalization is not necessary but only temporally reduce uncertainty with the accuracy of the co-authorship and institutional collaborations networks mapping in Vosviewer

Search Strategy

A systematic search strategy was developed to identify relevant literature on the implementation of Open Science within academic and research institutions. This involved constructing a targeted query using core keywords which is open science, open data, open access, citizen science, research data management, concepts of implementation keyword that use in the searching that is implementation, adoption, framework, policy, initiative, strategy, and terms representing the academic context such as universities, higher education, academic institution*, college*, library, libraries. The search was limited to the most recent five-year period. The complete list of search keywords and Boolean operators is presented in Table 1 and Figure 1.

Table 1: Search Keywords and Boolean Operators Used in the Query

Concept	Keywords / Phrases	Boolean Operator
Open Science Concepts	"open science", "open data", "open access", "citizen science", "research data management"	OR
Implementation Aspects	implementation, adoption, framework, policy, initiative, strategy	OR
Academic Context	universities, "higher education", "academic institution*", college*, library, libraries	OR

Volume: 11 Issues: 83 [June, 2026] pp. 861 - 882
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: academicinspired.com/jised
DOI: 10.55573/JISED.118371

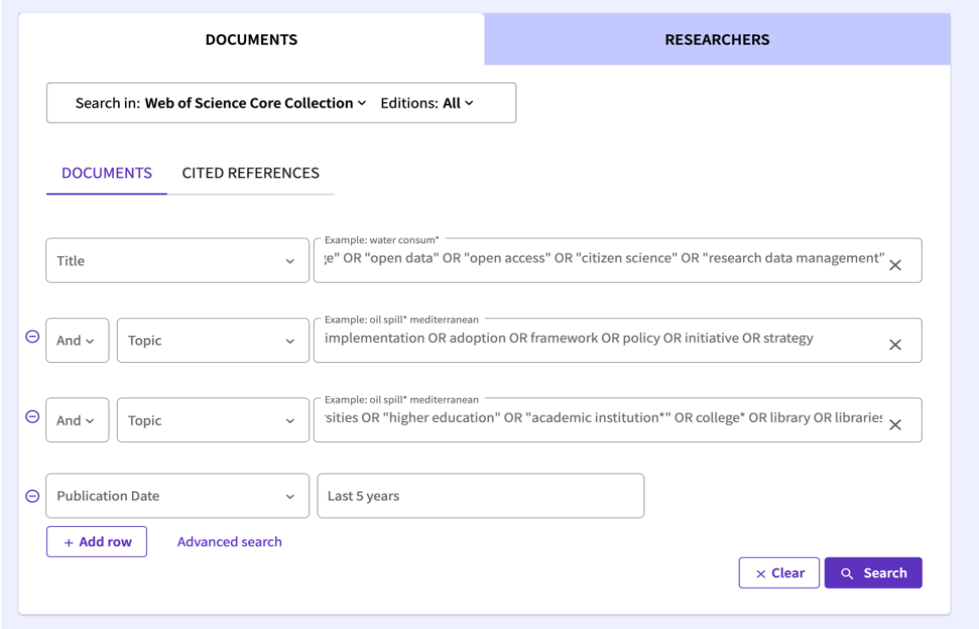

Figure 1: The search strategy and query input used in the Web of Science Core Collection

The actual query string used in WoS is as follows:

(TI = ("open science" OR "open data" OR "open access" OR "citizen science" OR "research data management"))
AND
(TS = (implementation OR adoption OR framework OR policy OR initiative OR strategy))
AND
(TS = (universities OR "higher education" OR "academic institution*" OR college* OR library OR libraries))
AND
(PY = last 5 years)

Inclusion and Exclusion Criteria

To ensure data relevance and quality, publications were included if they met the following criteria: publication year less than five years (data collected up until October 2023), peer-reviewed journal articles, review papers, or conference proceedings published in English that addressed Open Science implementation, adoption, policy, frameworks or strategies in academic/research institutions. Editorials, book reviews, theses and articles not addressed to the implementation of Open Science in any language were excluded. Further details are specified in **Table 2**.

Table 2: Inclusion and Exclusion Criteria

Criteria	Inclusion	Exclusion
Document Types	Peer-reviewed journal articles, review papers, conference proceedings	Editorials, book reviews, news articles, notes, letters, theses, dissertations
Publication Years	Last 5 years	Published before the last 5 years
Language	English	Non-English

Volume: 11 Issues: 83 [June, 2026] pp. 861 - 882
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: academicinspired.com/jised
DOI: 10.55573/JISED.118371

Topical Relevance	Focus on open science implementation, adoption, policy, framework, initiative, or strategy in academic or research institutions (including open data, open access, citizen science, and research data management)	Does not address open science practices or their implementation in academic or research institutions

Data Cleaning and Pre-processing

The dataset is retrieved and then goes through a rigorous process of cleaning and standardization. This involved normalizing author names (merging variants and correcting errors), standardizing and cleaning keywords (lowercasing, merging synonyms, reducing redundancy) and institutional names to official designations. After that, duplicate records were removed and only relevant documents satisfying the inclusion criteria were retained. Table 3 outlines the main data cleaning steps.

Table 3: Data Cleaning and Pre-processing Workflow

Step	Description
Standardization of Authors	Reviewed and merged name variants (e.g., "Smith J." vs. "Smith, John"), corrected typographical errors, and ensured consistency in initials and full names.
Standardization of Keywords	Converted all keywords to lowercase, unified synonyms and variants (e.g., "open-access" vs. "open access"), removed redundancies, and grouped similar terms.
Standardization of Institutions	Merged variants for the same institution, corrected misspellings and abbreviations, and used official institution names where possible.
Removal of Duplicates	Identified and removed duplicate entries to avoid double counting.
Exclusion of Irrelevant Records	Excluded records not meeting the inclusion criteria (see Table Y).

Analytical Tools and Techniques

According to Van Eck & Waltman (2010) VOSviewer was used for bibliometric mapping and network visualization, allowing for constructing and interpreting co-authorship networks, institutional collaboration, country maps and keyword co-occurrences clusters. Excel was also used to aid descriptive analyses, such as counting publication trends by year, productivity by journal or author/institution, and frequency distributions of document types and languages.

The main bibliometric methods of analysis involved were co-authorship that focus on collaboration among authors, institutions, and countries, keyword co-occurrence analysis which used identification of leading themes and trends, citation analysis for assessment of scholarly influence and impact, and network visualization that representing structural patterns and relationships in the literature. They are summarised in **Table 4**.

Volume: 11 Issues: 83 [June, 2026] pp. 861 - 882
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: academicinspired.com/jised
DOI: 10.55573/JISED.118371

Table 4: Summary of Bibliometric Techniques Used in the Study

Technique	Purpose / Description	Citation(s)
Co-authorship analysis	Analyses collaborations between authors, institutions or across the country on a common basis of shared publications. Maps co-author networks to show main communities, degree of collaboration and research clusters.	Donthu et al. (2021) and Glänzel & Schubert (2006)
Keyword co-occurrence analysis	Examines the frequency and patterns of keywords appearing together in publications. Helps uncover research themes, conceptual structures, and emerging trends within Open Science.	Aria & Cuccurullo (2017) and Zupic & Čater (2015)
Citation analysis	Measures the impact and influence of publications, authors, or journals through citation counts. Identifies seminal works, influential papers, and tracks the diffusion of knowledge.	Donthu et al., 2021; Moed, 2005
Institutional and country collaboration analysis	Investigates collaborative efforts among institutions and countries, visualizing networks to highlight leading contributors and cross-border partnerships in Open Science research. Provides insight into internationalization and the role of institutional repositories	Van Eck & Waltman (2010)

Results And Discussion

Publication Trends and Output

Table 5 shows a constant and dynamic trends of published documents related to Open Science that are indexed in Web of Science from 2021 to 2025, considering only the set of documents. The highest number of yearly publications on this topic was noted in 2023 (90) which later slightly decreased over the following years. This pattern could represent an upsurge in research attention, funding ups and downs, or simply the normal evolution of a field over time. Publication counts for 2025 may also be undercounted because of lags in indexing.

Table 5: Annual Scientific Production of Open Science from 2021 - 2025

Year	Number of Articles in WoS
2021	74
2022	66
2023	90
2024	85
2025	53

Document Types and Languages

Journal articles are the dominant output type representing 88.3% of all publications (**Figure 4**, and **Table 7** in pages 50 and 51) indicating a field preference for peer-reviewed outputs. Other article types including proceeding papers (5.7%), early access (5.5%), and review articles (4.4%) were also present but make a much smaller contribution to the literature.

Volume: 11 Issues: 83 [June, 2026] pp. 861 - 882
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: academicinspired.com/jised
DOI: 10.55573/JISED.118371

Table 6: Distribution of Document Types in Open Science Publications

Document Types	Record Count	%
Article	324	88.283
Proceeding Paper	21	5.722
Early Access	20	5.450
Review Article	16	4.360
Editorial Material	8	2.180
Data Paper	1	0.272

Figure 2: Tree map illustrating the distribution of document types in Open Science publications

English represents 87.7%, is the dominant language of publication with very small contributions from Portuguese, Russian, Spanish and other languages (**Figure 3** and **Table 7**), confirming both the global polycentricity and the continuing domination of English in scholarly communication**.**

Figure 3: Tree map of Publication Languages

Volume: 11 Issues: 83 [June, 2026] pp. 861 - 882
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: academicinspired.com/jised
DOI: 10.55573/JISED.118371

Table 7: Distribution of Publication Languages in Open Science Literature

Languages	Record Count	%
English	322	87.738
Portuguese	13	3.542
Russian	11	2.997
Spanish	11	2.997
German	5	1.362
Chinese	2	0.545
Croatian	1	0.272
Italian	1	0.272
Ukrainian	1	0.272

Thematic and Keyword Analysis

The keyword mapping (**Figure 4**) shows that "**open access**", "**open science**", and "**academic libraries**" and "**citizen science**" are dominant pillars with respect to the themes based on VOSviewer-based capitalization. While clustering analysis highlights strong connections between open science practices with management, scholarly communication and institutional repositories.

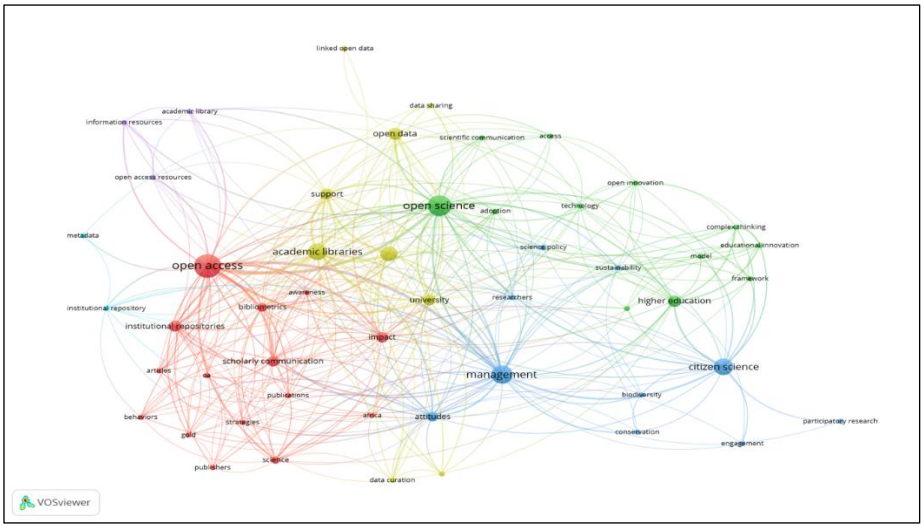

Figure 4: Network visualization of keyword co-occurrence generated using VOSviewer

Density and overlay visualizations **Figure 5** and **Figure 6** show that topics like data sharing, educational innovation, and participatory research are emerging and gaining prominence.

Volume: 11 Issues: 83 [June, 2026] pp. 861 - 882
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: academicinspired.com/jised
DOI: 10.55573/JISED.118371

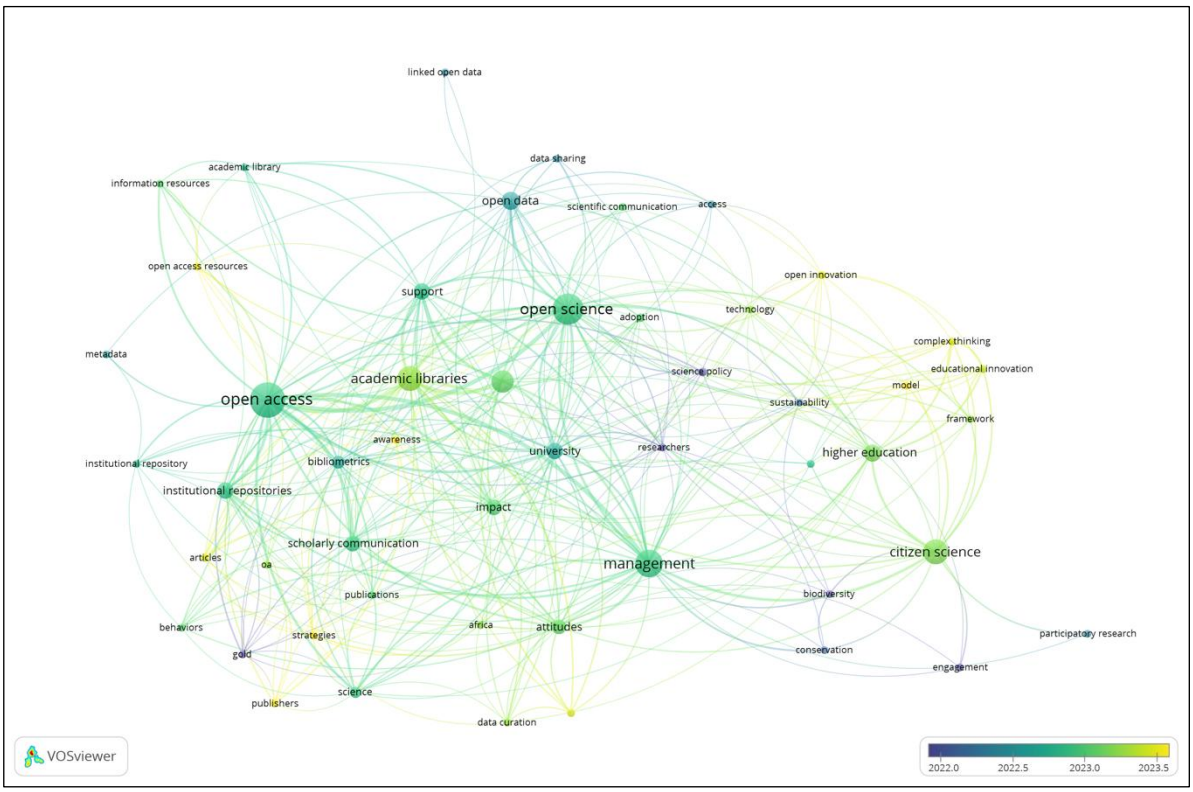

Figure 5: Overlay Visualization of Emerging Topics and Clusters

Citation and Influence Analysis

The most cited papers address the adoption of open science practices, stakeholder participation, research data management, and policy frameworks like in **Table 8**. The leading authors were Armeni, Brinkman, Carlsson, and Eerland reflect the collaborative nature of high-impact work in this area like in shown in the **Table 9**.

Table 8: Most Cited Documents

No.	Title	Authors	Year	Times Cited (WoS)	DOI
1	Towards wide-scale adoption of open science practices	Armeni, Kristijan; Brinkman, Loek; Carlsson, Rickard; Eerland, Anita	2021	43	10.1093/scipol/scab039
2	A Systematic Literature Review on the Participation of Stakeholders in Open Science	Vasiliades, Michalis A.; Hadjichambis, Andreas C.	2021	29	10.3390/su13137457
3	Research Data Management (RDM) and the Evolving Role of Librarians	Andrikopoulou, Angeliki; Rowley, Jennifer; Walton, Graham	2022	23	10.1080/13614533.2021.1964549

Volume: 11 Issues: 83 [June, 2026] pp. 861 - 882
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: academicinspired.com/jised
DOI: 10.55573/JISED.118371

4	Towards a model of research data management readiness	Marlina, Ekawati; Hidayanto, Achmad Nizar	2022	22	10.1016/j.lisr.2022.101141
5	Bibliodiversity at the Centre: Decolonizing Open Science	Berger, Monica	2021	20	10.1111/dech.12634
6	Survey on Open Science Practices in Functional Neuroimaging	Paret, Christian; Unverhau, Nike; Feingold, Franziska	2022	19	10.1016/j.neuroimage.2022.119306
7	Research Data Management Implementation at Peking University	Nie, Hua; Luo, Pengcheng; Fu, Ping	2023	6	10.1016/j.dataint.2022.100151
8	Impact of Open Access Policy on Brazilian Science	Figueiredo, Claudia; Neves, Abilio Afonso Baeta	2023	4	10.1590/0001-3765202320210777
9	Formal policy framework and ICT tools for research data management	Arthur, Beatrice; van der Walt, Thomas	2022	3	10.1177/02666669221081381
10	Research Data Management Sustainability: Services and Stakeholders	Griffin, Tina M.; Janz, Margaret	2021	3	10.1353/pla.2021.0027

Table 9: Most Cited Authors

No.	Author	Total Citations
1	Armeni, Kristijan	43
2	Brinkman, Loek	43
3	Carlsson, Rickard	43
4	Eerland, Anita	43
5	Vasiliades, Michalis A.	29
6	Hadjichambis, Andreas C.	29
7	Andrikopoulou, Angeliki	23
8	Rowley, Jennifer	23
9	Walton, Graham	23
10	Marlina, Ekawati	22

Citation metrics such as h-index (15) and g-index (20) demonstrate a solid core of influential works like in **Table 10**. Comparison of local and global citation scores shows alignment, indicating that the most cited works in Open Science are also highly recognized outside the field **Table 11.**

Volume: 11 Issues: 83 [June, 2026] pp. 861 - 882
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: academicinspired.com/jised
DOI: 10.55573/JISED.118371

Table 10: Local vs. Global Citation Scores

Title	Times Cited (WoS Core)	Times Cited (All Databases)
Research Data Management Implementation at Peking University	6	7
Impact of Open Access Policy on Brazilian Science	4	4
Others (majority)	0	0

Table 11: Citation Metrics

Metric	Value	Description
h-index	15	Indicates there are at least 15 publications that have each received a minimum of 15 citations, reflecting a solid core of influential research.
g-index	20	Indicates that the top articles collectively received at least 400 citations ($20^2 = 400$), highlighting the impact of several highly cited, seminal works.

Foundational papers remain highly cited, while several recent publications are rapidly accumulating citations, indicating an evolving field like in **Table 12.**

Table 12: Influence of Foundational and Recent Publications

Title	Year	Times Cited (WoS)
Towards wide-scale adoption of open science practices	2021	43
IdroGEO: A Collaborative Web Mapping Application	2021	42
A Systematic Literature Review on the Participation of Stakeholders	2021	29
Open Science in Practice: Institutional Strategies and Barriers	2022	27
Global Trends in Open Data and Research Collaboration	2021	23
Policy Development for Open Access: Comparative Perspectives	2022	21
Citizen Science and Data Sharing: Lessons from the Field	2021	19
Implementing FAIR Principles in Research Data Management	2022	18
Open Science Platforms: Technological Innovations and Challenges	2021	17
The Role of Institutional Repositories in Promoting Open Science	2021	15

Journal and Source Analysis

The most productive journals are *Nauchnye I Tekhnicheskie Biblioteki*, *Publications*, *and Insights and The UKSG Journal* reflect a blend of library and information science and multidisciplinary coverage like shown in Table 13. The *Journal of Academic Librarianship* leads in total citations, followed by *Science and Public Policy* and *Sustainability*, showing that influence and productivity are sometimes concentrated in different journals like the data in Table 14.

Volume: 11 Issues: 83 [June, 2026] pp. 861 - 882
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: academicinspired.com/jised
DOI: 10.55573/JISED.118371

Table 13: Most Productive Journals

No.	Journal Title	Number of Articles
1	Nauchnye I Tekhnicheskie Biblioteki-Scientific And Technical Libraries	10
2	Publications	10
3	Insights-The Uksg Journal	10
4	Library Management	8
5	Scientometrics	7
6	Journal Of Academic Librarianship	7
7	Information Development	6
8	Sustainability	6
9	Bibliothek Forschung Und Praxis	6
10	Digital Library Perspectives	5

Table 14: Most Influential Journals by Citation Impact

No.	Journal Title	Total Citations
1	Journal of Academic Librarianship	71
2	Science and Public Policy	61
3	Sustainability	57
4	Library & Information Science Research	46
5	Scientometrics	45
6	ISPRS International Journal of Geo-Information	42
7	Publications	35
8	Development and Change	31
9	Insights-The UKSG Journal	28
10	Journal of Librarianship and Information Science	27

Geographical and Institutional Analysis

Spain (99 articles), Germany (87), Brazil (48), and the Netherlands (40) are among the most productive countries, with strong output also from India, England, Canada, China, Mexico, and Australia as shown In **Table 15**. Top institutions include Tecnologico de Monterrey, Russian Academy of Sciences, and University of Barcelona as shown in **Table 16.**

Table 15: Top 10 most productive countries in Open Science research.

No.	Country	Number of Articles
1	Spain	99
2	Germany	87
3	Brazil	48
4	Netherlands	40
5	India	38
6	England	38
7	Canada	37
8	China	33
9	Mexico	33
10	Australia	26

Volume: 11 Issues: 83 [June, 2026] pp. 861 - 882
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: academicinspired.com/jised
DOI: 10.55573/JISED.118371

Table 16: Top 10 most productive institutions in Open Science research

No.	Institution	Number of Articles
1	Tecnologico de Monterrey	16
2	Russian Academy of Sciences	12
3	Siberian Branch of the Russian Academy of Sciences	12
4	University of Barcelona	11
5	State Public Scientific & Technological Library of the Siberian Division of the Russian Academy of Sciences	11
6	University of South Africa	10
7	University of Zagreb	10
8	University of Punjab	10
9	KU Leuven	10
10	Arizona State University	10

Collaboration and Network Patterns

International collaboration is centered around the USA, Germany, and England, which act as major global hubs like in the Figure 6 and Table 17. The institutional network, however, is fragmented with limited co-authorship among even the most productive organizations like shown in Figure 7 and Table 18.

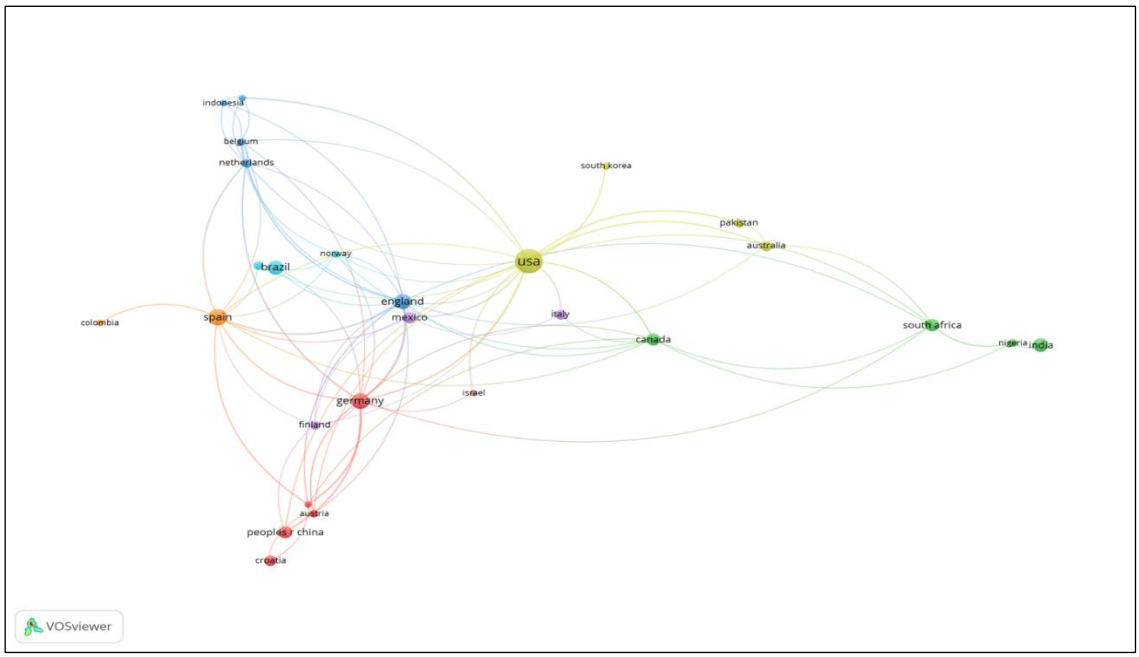

Figure 6: Country Co-Authorship Network

Table 17: Top 10 Most Collaborative Countries In Open Science Research

Rank	Country	Number of Documents	Total Link Strength
1	USA	64	30
2	Germany	28	26
3	England	26	23
4	Spain	29	19
5	Netherlands	8	12

Volume: 11 Issues: 83 [June, 2026] pp. 861 - 882
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: academicinspired.com/jised
DOI: 10.55573/JISED.118371

6	Canada	17	10
7	Denmark	5	10
8	Belgium	6	9
9	Mexico	15	9
10	South Africa	16	9

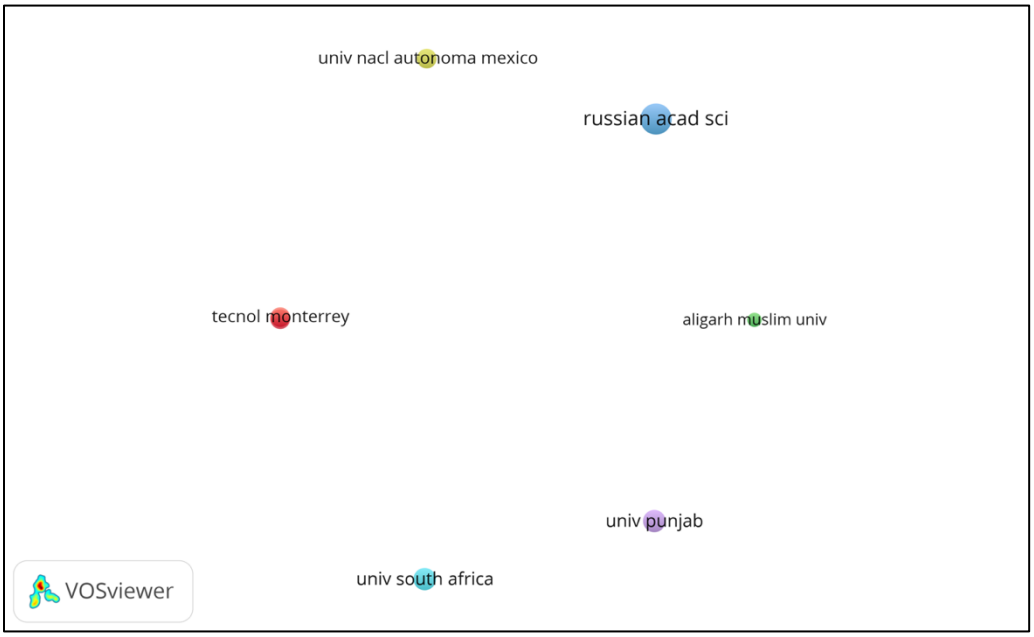

Figure 7: Institutional Co-Authorship Network

Table 18: Top Institutions by Collaboration

Rank	Organization	Documents	Citations	Total Link Strength
1	Tecnol Monterrey	7	48	1
2	Univ Barcelona	7	40	1
3	Aligarh Muslim Univ	5	17	0
4	Russian Acad Sci	11	10	0
5	Univ Nacl Autonoma Mexico	7	9	0
6	Univ Punjab	8	48	0
7	Univ South Africa	8	8	0

Author-level collaboration is dominated by a few tightly-knit clusters, led by researchers such as Sanabria-Z and Molina-Espinosa **Figure 8.**

Volume: 11 Issues: 83 [June, 2026] pp. 861 - 882
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: academicinspired.com/jised
DOI: 10.55573/JISED.118371

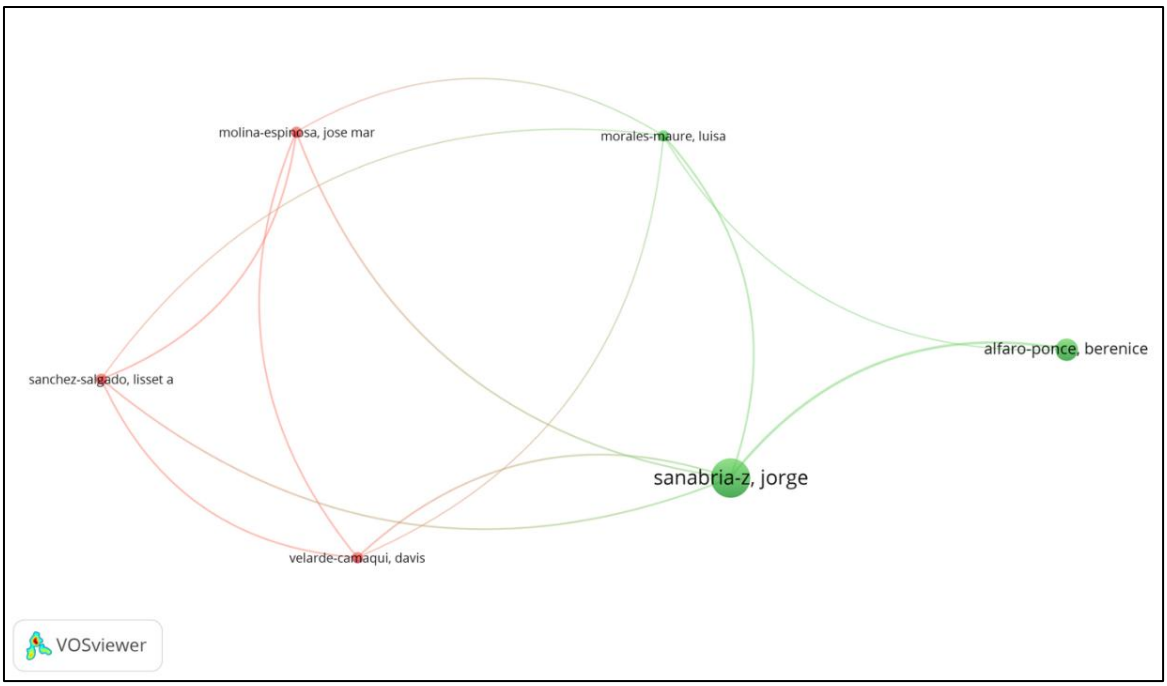

Figure 8: Author Collaboration Network

Institutional Partnerships and International Collaboration

Even with strong international connections, however, institutional-level collaboration is weak and ranges from totally independent institutions such as indicated in the **Figure 9**. The international co-authorship network like in the (Figure 10) which represents a multiple-cluster but continues omission for many countries.

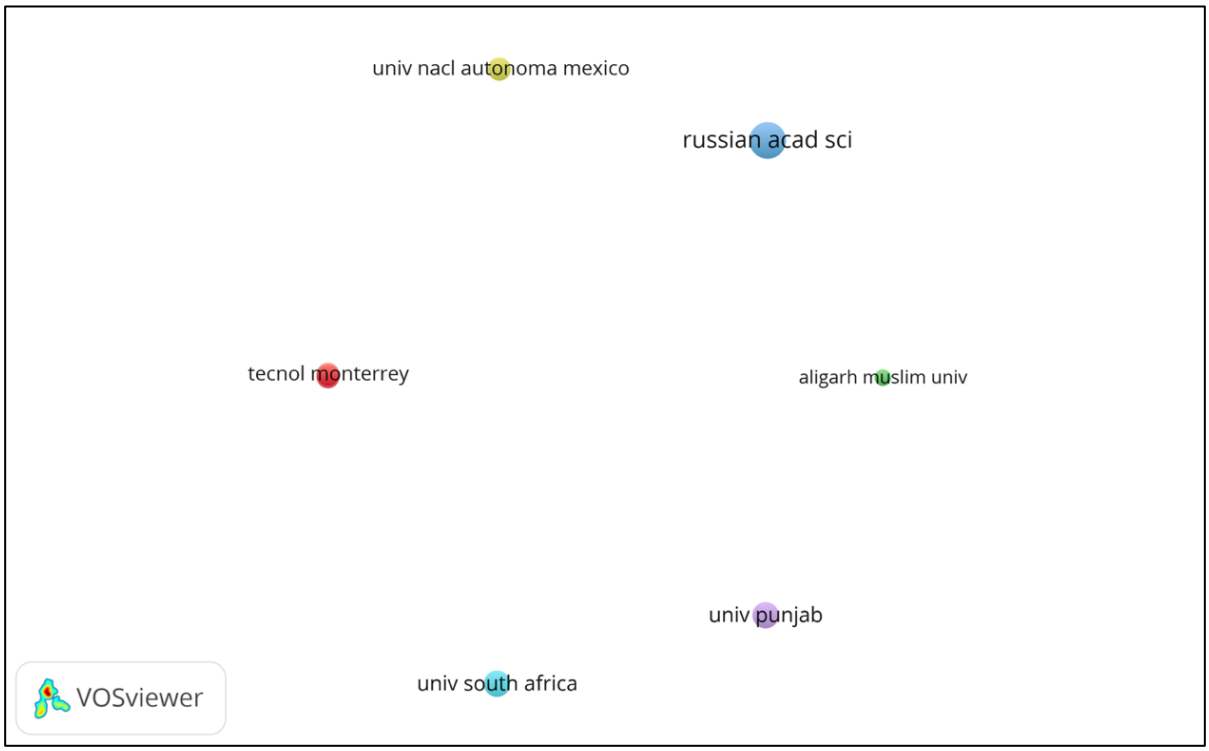

Figure 9: Institutional Co-Authorship Network

Volume: 11 Issues: 83 [June, 2026] pp. 861 - 882
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: academicinspired.com/jised
DOI: 10.55573/JISED.118371

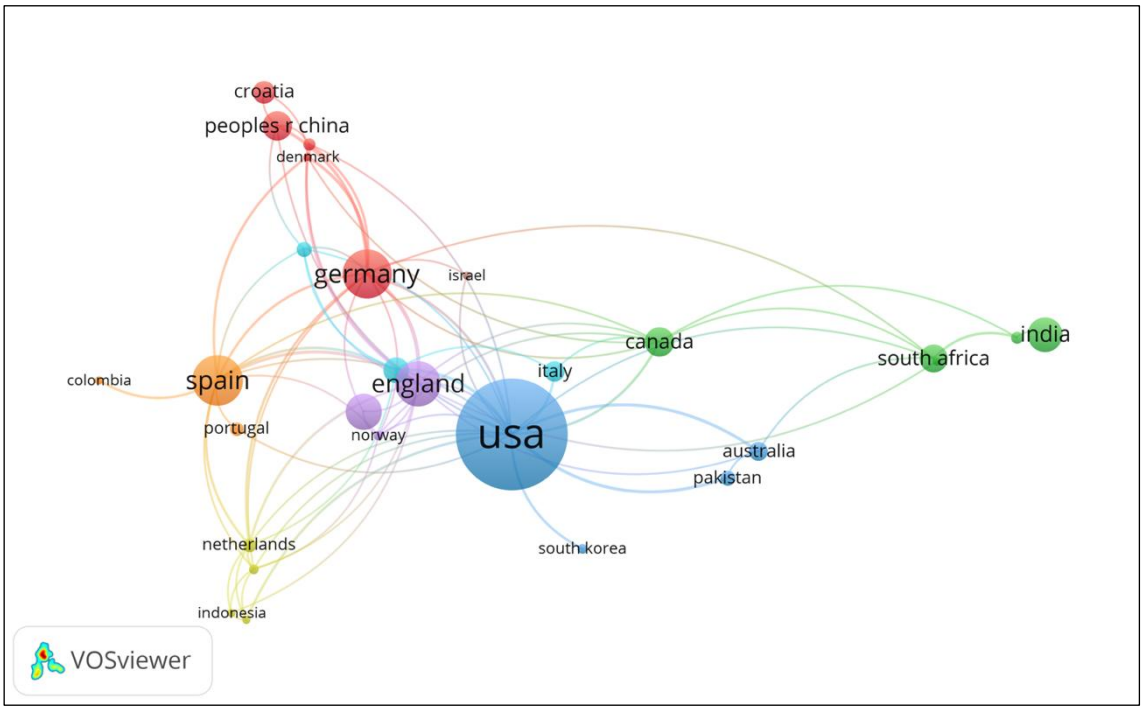

Figure 10: International Co-Authorship Network

Table 19

Country	Documents	Citations	Total Link Strength
USA	64	224	30
Germany	28	151	26
England	26	107	23
Spain	29	111	19
Netherlands	8	65	12
Canada	17	43	10
Denmark	5	16	10
Belgium	6	59	9
Mexico	15	56	9
South Africa	16	29	9

Discussion

Interpretation of Key Findings

The results of this bibliometric analysis show Open Science as an important driving force in the academic landscape, with its rise showing a steady growth development over the past 5 years. This increasing attention not only reflects interest among researchers and institutions, but a wider set of changes in research governance, policy, and global priorities particularly related to international agreements such as the UNESCO Recommendation on Open Science (UNESCO, 2021) and the COVID-19 challenges (Tennant et al., 2016).

However, rather than being an even playing field. Productivity and influence are tightly bound to Europe and North America, though sporadic contributions coming from Latin America or Asia suggest a slow but steady process of globalization. The field remains dominated by a small number of leading institutions and English-language output, both potentially limiting access

Volume: 11 Issues: 83 [June, 2026] pp. 861 - 882
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: academicinspired.com/jised
DOI: 10.55573/JISED.118371

and participation for scholars across the globe (Mongeon & Paul-Hus, 2021). Thematic analysis validates that while open access, research data management and citizen science are still important topics, issues such as the principles of FAIR data and open educational resources emerge showing how the movement has evolved to meet new challenges.

Collaboration networks illustrate both progress and remaining barriers. Select countries may serve as hubs worldwide, but institutional arrangements tend to be parochial and institutional partnerships based upon longstanding networks of collaboration. Establishing international consortia and collaborative institutional grant programs so that diverse, cross-regional research partnerships can emerge, will facilitate the diffusion of best practices and enhance the global resonance of Open Science.

How This Study Complements or Differs from Prior Research

This work brings novelties and extensiveness to the growing corpus of bibliometric analyses on Open Science. In accordance with the prior study, such as Tennant et al. (2016) and Vicente-Saez & Martinez-Fuentes (2018), the findings substantiate the predominance of open access and data sharing as the two main pillars of the movement. Yet, using recent WoS data and advanced network visualization, this study identifies both the established themes, and new or fast-emerging clusters such as open educational recourses, digital repositories, and policy-driven research assessment.

The present work provides a more recent comprehensive view than previous studies that tended to look at narrower timeframes or subsets of the corpus. Whereas Fecher & Friesike (2014) have pointed out the theoretical diversity of Open Science through five schools of thoughts, the empirical mapping conveys how these streams are concretised by practices and approaches at the level of research and institutions. Furthermore, the comparison of altimetric data most particularly the similarity between local and global citation scores implies that significant Open Science publications garner remarkable interest in relation to both contexts. Such global visibility reinforces the credibility of Open Science as a multidisciplinary and cross-sector movement.

This study different from previous work by critically analysing collaboration. Although previous studies of Open Science have often interpreted its global nature as a positive development, the network analyses reveal that structural divides continue to exist especially at the institutional level. This insight reveals that, rather than focusing merely on aggregate output and citation counts, we need to intervene in the social and infrastructural context in which research collaboration takes place.

Policy and Practical Implications

These results are highly relevant for research policymakers, academic leaders, and funding agencies seeking to promote Open Science. First, the pervasive consolidation of output and influence among a small number of countries and institutions requires investment in capacity-building initiatives for less represented regions. Strategically, cross-border collaboration could be incentivised and fostered by funding agencies and international organisations with joint research infrastructures in addition to the sharing of best practice through open training resources.

Second, the over-reliance on English and unequal global distribution of output highlight that reducing barriers to entry is crucial. Policymakers and institutional leaders should promote the

Volume: 11 Issues: 83 [June, 2026] pp. 861 - 882
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: academicinspired.com/jised
DOI: 10.55573/JISED.118371

development of multilingual repositories, translation services, and inclusive publishing policies to ensure broader participation in the Open Science ecosystem. Libraries, with their dual roles as advocates and providers of infrastructure, are particularly well positioned to spearhead such efforts.

Third, the emerging topics of research data management, the FAIR principles, and open educational resources highlights the increasing sophistication of a researcher's skill set, as well as the needs of an institution. This area of professional development, as well as the creation of functional frameworks and flexible guidelines which acknowledge open practices in research appraisal, calls for urgent attention from universities.

Finally, continuous analysis and assessment remains important as highlighted by this study. Actionable intelligence for improving Open Science policies to be more effective at the local, national, and global levels can be derived from the powerful, transparent bibliometric techniques augmented with qualitative reviews.

Challenges And Limitations

Limitations of Web of Science Coverage

An important drawback for this study is that it considers only the Web of Science (WoS) Core Collection as the single source of data. While WoS is known for having a broad, deep, and rigorously curated selection of scholarly works, it does not fully capture the entirety of scholarly communication from outside North America and Western Europe (Mongeon & Paul-Hus, 2021). Many relevant publications in Open Science, especially those from regional or national and non-English language journals, may be missed because of WoS's selective inclusion policies. This could result in a bias where there is over-reliance on contributions from established academic centers and underaccounting of contributions from emerging economies, smaller institutions, or local research networks.

Additionally, the timeliness of coverage for many newer or interdisciplinary journals that are essential to the most current discussions in Open Science is often lacking. For example, regional disseminators of knowledge, such as open access repositories, practitioner journals, or institutional repositories, are frequently excluded from the databases. As a result, the innovative or context-specific Open Science practices and debates from underrepresented regions are unlikely to be captured in this analysis. Researchers and policymakers who interpret these findings need to be very careful when applying these trends and patterns to the whole global Open Science population.

Author and Institution Name Ambiguity

The unambiguous identification of authors and their affiliations is a common problem in bibliometric research. Spelling variations, use of initials, transliteration from other scripts and even changes of user affiliation can cause a fragmentation of entries or duplicates in the database (Torvik & Smalheiser, 2009). One researcher may be listed as multiple people because their name is spelled differently in the records. This applies to institutions too, for which due to some translation or reorganisation their name may come in a different format such as shortened or encoded.

While names and affiliations have been homogenised in a high-quality data cleaning effort, some errors may remain uncorrected. This has an impact on the accuracy of author bibliometric

Volume: 11 Issues: 83 [June, 2026] pp. 861 - 882
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: academicinspired.com/jised
DOI: 10.55573/JISED.118371

measures, institutional productivity measurements and co-author networks. As an example, split records could cause over-counting collaboration between two institutions that have many aliases and under-count prolific authors. These problems highlight the importance of a well-defined landscape of minimum requirement for bibliographic metadata, Persistent Identifiers (PIDs) initiatives, which encourage improved certainty of bibliometric mapping in future research: such as ORCID identifiers for authors and ROR identifiers for institutions.

Constraints in Bibliometric Techniques and Tools

The software tools and techniques of analysis used in this study are common in the domain, but they also have some limitations that could affect the outcomes. For example, VOSviewer is excellent for the mapping and visualization of large-scale bibliometric networks. However, its output is very dependent on threshold values such as the minimum frequency of occurrence for keywords or co-authorships to be included. Decreasing the thresholds makes the network more detailed but may add noise; increasing the thresholds, however, may highlight only the most important clusters and in turn ignore emerging or niche trends.

Moreover, the focus on publication volume, citation counts, as well as centrality in the research network gravitate towards assessing quantitative output. The qualitative value or impact on society in broader terms is not examined. An example is a significant policy report or community action that, while impactful, does not show up in citation databases. In the same manner, while useful for surface level pattern and cluster identification, network visualizations are static and as a result are unable to capture the dynamic collaboration or thematic emphasis changes within a given period. This indicates the necessity of more sophisticated approaches that blend qualitative research with bibliometric mapping and incorporate ethnographic elements to deepen the understanding of Open Science evolution.

Generalizability and Interpretive Limits

Several limitations restrict the generalizability and interpretation of the findings. Such an emphasis on English-language records surely misses large swathes of impactful, important work published in other countries where English is not the main academic first language. Such lexical prejudice is not only harmful to the visibility of local ingenuity but also reinforces the global imbalances of research visibility, recognition and impact that are already in place. This study may also be limited because it used only the WoS database and limited perspective stemming from other international databases such as Scopus, Dimensions or specialized repositories or grey literature as well as beyond the Walls of Citation.

Furthermore, the study focuses on quantitative bibliometric techniques that do not consider in-depth questions of motivation, barriers and surrounding contexts as to why Open Science is adopted or not. There is nothing, for example, that tells us about the kinds of policies, funding frameworks or cultural attitudes that drive or inhibit open practice in particular contexts. Thus, whilst the analysis adds a global perspective on these trends and patterns for Open Science, it is also fair to advocate for performing bidirectional triangulation of qualitative methods like interviews, case studies or policy analyses with bibliometric data which could serve as an adjunct to other aspects of the dynamically evolved (towards) Open Science world
.

Volume: 11 Issues: 83 [June, 2026] pp. 861 - 882
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: academicinspired.com/jised
DOI: 10.55573/JISED.118371

Future Research Directions

Integration of Qualitative Insights into Bibliometric Studies

This paper provides an extensive quantitative overview of the Open Science research landscape. However, further research should employ qualitative methodologies to yield more in-depth insights into the region under investigation. Though bibliometric data are fundamental for identifying emerging trends, networks, thematic clusters and even mapping them onto nodes on an axon (or may be on the social media), they fail to account motivations, challenges faced and lived experiences of practitioners within the space/involved with Open Science. One way of achieving this is by combining qualitative research (e.g. through in-depth interviews, focus groups or case studies) to give insight into the underlying motivations behind Open Science behaviours in less well-represented geographical areas, regions or institutions where successes or barriers may differ.

Systematic understanding of how institutional cultures, policy structures, funding frameworks and individual researcher philosophies inform the practice of Open Science Such information is critical to develop low-risk, contextual policies that can be effective. This highlights the possibility of multi-method rich qualitative understandings of how Open Science is expressed and valued in different cultural and institutional contexts alongside bibliometric mapping, both as survey-based methodologies and ethnography.

Expanding Analysis Using Other Databases and Data Sources

A last potential perspective for this research is the consideration as a different bibliometric evaluation of other sources than the Web of science. Higher coverage of journals with Scopus, Dimensions, and even Google Scholar (e.g. regional, other than English-language manuscripts, open-access publications from government institutions or "grey literature", preprints). The diversification of knowledge by triangulating results from multiple databases makes it possible to more effectively address biases in coverage and can contribute toward providing a more holistic view of Open Science trends worldwide.

A last potential perspective for this research is the consideration as a different bibliometric evaluation of other sources than the Web of science. Higher coverage of journals with Scopus, Dimensions, and even Google Scholar (e.g. regional, other than English-language manuscripts, open-access publications from government institutions or "grey literature", preprints). The diversification of knowledge by triangulating results from multiple databases makes it possible to more effectively address biases in coverage, and can contribute toward providing a more holistic view of Open Science trends worldwide.

The Rise of Artificial Intelligence, Metadata Standards, and Ethical Dimensions in Open Science

AI and machine learning is a growing part of Open Science with benefits & challenges. AI-enabled mechanisms will enhance literature discovery, automate intricate data-analytics workflows and develop new collaborative frameworks for research dissemination. Simultaneously, the iron-fisted incorporation of AI technology raises considerable issues including limited opacity in procedures, data management concerns and reproducibility crises. Rather the incorporation of AI methodologies in workflow processes of Open Science and its impact on research integrity, ethics, trust in science, and accessibility of scientific information is much more relevant.

Volume: 11 Issues: 83 [June, 2026] pp. 861 - 882
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: academicinspired.com/jised
DOI: 10.55573/JISED.118371

The evolving technology is the backdrop against which the new work to develop standards of metadata and interoperability frameworks will take place. As the research ecosystem evolves to start embracing Open Science, let us be mindful that the fundamental essence of Open data and research lies in ensuring that within the data, publications and research outputs is maintained by upholding principles embedded and enshrined by findability, accessibility, interoperability and reusability (FAIR). We need to analyse the effectiveness of present metadata standards, understand gaps in reality and promote or progress best practices towards effective data stewardship.

With the growth of Open Science, new ethical issues arise, including consent and privacy in data sharing, along with concerns about fair participation and acknowledgment in collaborative research. Researchers from all communities need to be involved in exploring these issues to foster the responsible advancement of Open Science.

Conclusion

This bibliometric study offers an overview of the expand, collaborative facets, and the span of Open Science research within the last five years, leveraging 367 documents available in the Web of Science Core Collection. The study substantiates that Open Science has increasingly become a major focal point in academic area, as evidenced by the expanding publication volume and shifting research priorities.

The evidence suggests that Open Science research has been centralized in Europe and North America, specifically in countries like Brazil, Germany, and Spain. Challenges that have persistence include publishing in English since it is the only language accepted. Citizen science, open access, and research data management remain as dominant distinct areas while emerging topics such as Fair data principles and open educational resources are becoming increasingly more common.

While the international level demonstrates strong collaboration, institutional and individual author collaboration still lags behind. This indicates possibilities for strengthening international collaboration and enabling more diverse coalitions.

This study provides important, data-driven insights, but is limited to the Web of Science and quantitative bibliometric measures only. Further research is needed that incorporates qualitative approaches and a wider range of data to provide a more complete analysis. Looking to the future, more advanced collaboration and investment in the open infrastructure will be essential for the advancement of Open Science.

Volume: 11 Issues: 83 [June, 2026] pp. 861 - 882
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: academicinspired.com/jised
DOI: 10.55573/JISED.118371

References

Allen, C., & Mehler, D. M. A. (2019). Open science challenges, benefits and tips in early career and beyond. *PLoS Biology*, *17*(5), e3000246. https://doi.org/10.1371/journal.pbio.3000246

Aria, M., & Cuccurullo, C. (2017). bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics*, *11*(4), 959–975. https://doi.org/10.1016/j.joi.2017.08.007

Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research*, *133*, 285–296. https://doi.org/10.1016/j.jbusres.2021.04.070

European Commission. (2016). *Open Innovation, Open Science, Open to the World: A Vision for Europe*. https://doi.org/10.2777/061652

Falagas, M. E., Pitsouni, E. I., Malietzis, G. A., & Pappas, G. (2008). Comparison of PubMed, Scopus, Web of Science, and Google Scholar: strengths and weaknesses. *The FASEB Journal*, *22*(2), 338–342. https://doi.org/10.1096/fj.07-9492lsf

Fecher, B., & Friesike, S. (2014). Open Science: One Term, Five Schools of Thought. In *SSRN Electronic Journal*. Springer International Publishing. https://doi.org/10.2139/ssrn.2272036

Glänzel, W., & Schubert, A. (2006). Analysing Scientific Networks Through Co-Authorship. In *Handbook of Quantitative Science and Technology Research* (pp. 257–276). Springer. https://doi.org/10.1007/1-4020-2755-9_12

Mongeon, P., & Paul-Hus, A. (2021). The journal coverage of Web of Science and Scopus: a comparative analysis. *Scientometrics*, *126*(6), 5113–5142. https://doi.org/10.1007/s11192-021-03948-5

Sugimoto, C. R., Work, S., Larivière, V., & Haustein, S. (2017). Scholarly use of social media and altmetrics: A review of the literature. *Journal of the Association for Information Science and Technology*, *68*(9), 2037–2062. https://doi.org/10.1002/asi.23833

Tennant, J. P., Waldner, F., Jacques, D. C., Masuzzo, P., Collister, L. B., & Hartgerink, C. H. J. (2016). The academic, economic and societal impacts of Open Access: an evidence-based review. *F1000Research*, *5*, 632.

Torvik, V. I., & Smalheiser, N. R. (2009). Author name disambiguation in MEDLINE. *ACM Transactions on Knowledge Discovery from Data*, *3*(3), 1–29. https://doi.org/10.1145/1552303.1552304

UNESCO. (2021). UNESCO Recommendation on Open Science. *United Nations Educational, Scientific and Cultural Organization*, 1–36. https://unesdoc.unesco.org/ark:/48223/pf0000379949.locale=en

Van Eck, N., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics*, *84*(2), 523–538.

Vicente-Saez, R., & Martinez-Fuentes, C. (2018). Open Science now: A systematic literature review for an integrated definition. *Journal of Business Research*, *88*, 428–436. https://doi.org/10.1016/j.jbusres.2017.12.043

Zupic, I., & Čater, T. (2015). Bibliometric Methods in Management and Organization. *Organizational Research Methods*, *18*(3), 429–472. https://doi.org/10.1177/1094428114562629