

Contextual Analysis of Conceptual Structures in China- and Non-China-Affiliated Research Communities (RQ4) using VOSviewer

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Method of Conducting Contextual Analysis of Conceptual Structure (RQ4)

In addition to the methodological comparisons explored in RQ1 through RQ3, this study incorporates a contextual analysis to examine the broader thematic and conceptual orientations of China-affiliated and non-China-affiliated research communities. This responds directly to the final research question: RQ4: *What are the dominant conceptual themes in literature reviews authored by China-affiliated versus non-China-affiliated researchers, and how might these thematic priorities help explain differences in methodological practices?* To address this question, a keyword co-occurrence analysis was conducted using author keywords from the 2,000 most-cited literature review publications in each group, as indexed in the Scopus database from 2015 to 2024. These large datasets were purposefully selected to ensure comprehensive thematic coverage and to capture the conceptual breadth of bibliometric-supported literature reviews across both research communities. The analysis was performed using VOSviewer (version 1.6.20) with complete counting applied. A minimum occurrence threshold—typically set at 10—was used to filter out low-frequency keywords, focusing the analysis on recurring terms that indicate coherent thematic directions. The resulting co-occurrence maps enabled the identification of major conceptual clusters in each corpus.

Rather than emphasizing disciplinary boundaries, this contextual approach seeks to situate methodological tendencies—such as the choice of software tools, the clarity of reporting, or the acknowledgment of analytical limitations—within the conceptual priorities of each research group. For instance, if China-affiliated reviews are more frequently aligned with applied technological domains (e.g., artificial intelligence, carbon emissions, sustainable development), and non-China-affiliated reviews are more focused on policy frameworks, educational reform, or innovation management, such thematic orientations may inherently influence how bibliometric methods are selected, applied, and interpreted. By linking conceptual structure with methodological behavior, this phase of the study offers a more interpretive and explanatory layer of analysis. It complements the descriptive comparisons presented earlier and addresses the growing call for reflexivity in bibliometric research. Specifically, it highlights how research focus and intellectual traditions may shape the use, transparency, and reporting of bibliometric practices across different institutional and regional contexts. The results of this analysis, accompanied by detailed cluster summaries in [Tables 1a and 1b](#), as well as visual representations in [Figures 1 and 2](#).

Result

To address RQ4—*What are the dominant conceptual themes in literature reviews authored by China-affiliated versus non-China-affiliated researchers and how might these thematic priorities help explain differences in methodological practices?*—his section presents the findings of a large-scale co-occurrence analysis of author keywords. The objective is to uncover the broader thematic orientations that underpin methodological behaviors within the two research communities. A total of 2,000 highly cited literature review publications were analyzed from each group. Using VOSviewer (v1.6.20) with complete counting and a minimum keyword occurrence threshold of 10, conceptual structures were visualized and clustered. The resulting thematic maps (Figures 1 and 2) and keyword tables (Tables 1a and 1b) provide a comparative overview of how each group conceptualizes and applies bibliometric-supported literature reviews.

To ensure the accuracy and interpretability of the co-occurrence network analysis, a comprehensive keyword cleaning and synonym standardization procedure was conducted. This process addressed inconsistencies such as spelling variations, acronyms, and overlapping terms. By employing a curated thesaurus file, synonymous keywords were consolidated under standardized labels, thereby reducing semantic fragmentation and strengthening the robustness of the analysis. Following this preprocessing step, 50 representative keywords (each occurring at least 10 times) were identified from an initial set of 77 keywords in the China-affiliated corpus, and 81 representative keywords (also with a minimum of 10 occurrences) were identified from an initial set of 96 keywords in the non-China-affiliated corpus.

1. Conceptual Themes in China-Affiliated Literature Reviews

The keyword co-occurrence network for China-affiliated studies revealed eight distinct thematic clusters (Table 1a, Figure 1). These clusters center around methodological development, environmental analytics, biomedical mapping, and tool-specific usage. A strong methodological core was evident, with frequent references to bibliometric analysis, CiteSpace, VOSviewer, and Web of Science. The largest cluster—Methodological core and sustainability applications—links bibliometric tools with emerging technological and environmental themes such as AI, blockchain, carbon emissions, and sustainable development. Another prominent cluster, Health-oriented bibliometric applications, captures the rise of bibliometric research in medical fields, particularly in response to global health crises (e.g., COVID-19, stroke, gut microbiota). Clusters devoted to traditional Chinese medicine and acupuncture underscore how national research priorities shape bibliometric landscapes.

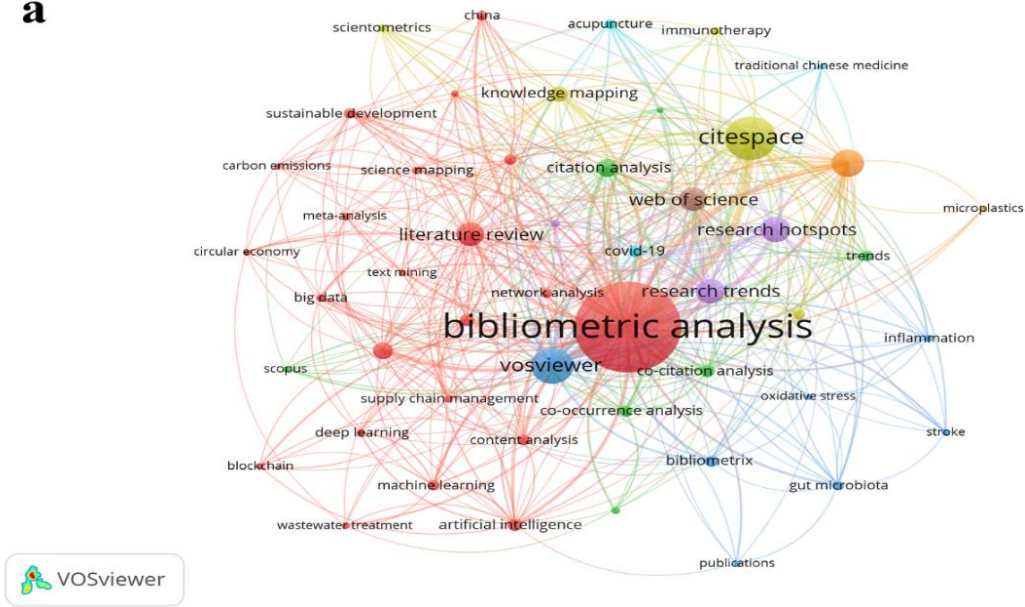
Figure 1a illustrates the thematic structure of China-affiliated publications, while Figure 1b overlays average publication years, revealing a surge of recent activity in biomedical and environmental applications. These newer clusters are colored yellow and green, indicating the community's responsiveness to contemporary challenges. The temporal visualization also shows how traditional topics such as co-citation analysis and meta-analysis remain foundational, appearing in earlier stages of the network's evolution. Overall, China-affiliated literature reviews show a dense and technically focused conceptual structure, heavily shaped by tool-based analysis and the country's research investment in Sustainability and public health.

Table 1a. Thematic clusters and conceptual themes of China-affiliated literature review publications based on keyword co-occurrence analysis (2015–2024). This table presents the results of a keyword co-occurrence analysis conducted on the top-cited literature review publications authored by China-affiliated researchers. Using a threshold of 10 occurrences and complete counting in VOSviewer, eight thematic clusters were identified, each reflecting distinct conceptual orientations. The analysis reveals a strong focus on methodological development, health applications, environmental Sustainability, and bibliometric software use, particularly CiteSpace and VOSviewer.

Cluster no.	Keywords	Thematic cluster	Conceptual themes
1	artificial intelligence, bibliometric analysis, big data, blockchain, carbon emissions, china, circular economy, climate change, content analysis, deep learning, literature review, machine learning, meta-	Methodological core and sustainability applications	Integration of bibliometric methods with AI,

	analysis, network analysis, science mapping, scientometric analysis, supply chain management, Sustainability, sustainable development, systematic literature review, text mining, wastewater treatment		Sustainability, and empirical environmental domains Focus on mapping citation
2	citation analysis, co-citation analysis, co-occurrence analysis, innovation, scopus, social network analysis, trends	Citation dynamics and analytical techniques	behavior, social networks, and innovation diffusion. Application of bibliometric tools in health, biomedical, and medical-related domains
3	bibliometrix, gut microbiota, inflammation, oxidative stress, publications, stroke, vosviewer	Health-oriented bibliometric applications	Scientific mapping in cancer, immunotherapy, and advanced bibliometric techniques
4	cancer, citespace, immunotherapy, knowledge mapping, scientometrics	Knowledge mapping and medical frontiers	Focused on trend identification and hot topics in research literature
5	depression, research hotspots, research trends	Emerging topics and trend detection	Themes rooted in Chinese medicine and pandemic-oriented bibliometric mapping
6	acupuncture, covid-19, traditional chinese medicine	Traditional and pandemic health studies	Environmental hazards and visual methods in bibliometric research
7	microplastics, visualization	Environmental analytics and visualization	Single-theme focus on Web of Science as a foundational database
8	web of science	Database-specific orientation	

a



b

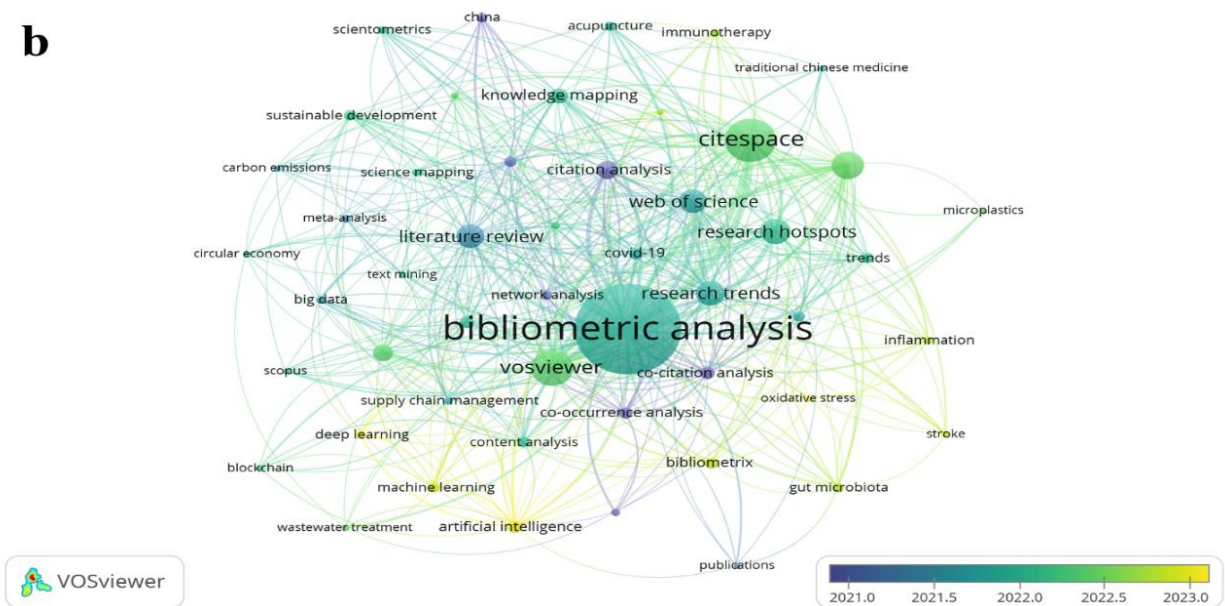


Figure 1. Co-occurrence network of keywords in China-affiliated literature review publications. Co-occurrence network visualization of author keywords from the most-cited China-affiliated literature review studies. Panel (a) shows the cluster-based thematic mapping, while panel (b) applies an overlay visualization to display the average publication year. Eight major clusters are revealed, highlighting methodological concentration around bibliometric analysis and CiteSpace, with strong links to environmental Sustainability, biomedical research, and emerging health themes such as COVID-19 and traditional Chinese medicine.

2. Conceptual Themes in Non-China-Affiliated Literature Reviews

In contrast, the co-word network of non-China-affiliated literature reviews generated seven thematic clusters, displaying a broader conceptual spread across disciplines and societal challenges (Table 1b, Figure 2). While bibliometric analysis remains central, the thematic contours of this group are more diversified and less tool centric. The dominant cluster, Sustainability, Environmental Policy, and Structural Analysis, reveals a strong integration of

bibliometric methods with global sustainability discourses—evident through keywords such as climate change, resilience, PRISMA, and circular economy. Another key cluster, Technological Innovation and Digital Transformation, demonstrates the application of bibliometric tools in tracking emerging technologies, such as IoT, blockchain, smart cities, and AI, in the health and logistics sectors. Notably, the non-China group also features dedicated clusters on educational technology, entrepreneurship, the SDGs, and social media and tourism, showing an openness to the interdisciplinary applications of bibliometric methods. [Figure 2b](#) illustrates how newer terms, such as digital transformation, e-learning, virtual reality, and the Sustainable Development Goals, have gained prominence in recent years, reflecting the community's agility in adopting bibliometric tools for real-world and policy-relevant issues. Compared to their China-affiliated counterparts, these publications place relatively less emphasis on bibliometric software per se and more on connecting bibliometric techniques with strategic management, educational frameworks, and social applications.

Table 1b. Thematic clusters and conceptual themes of non-China-affiliated literature review publications based on keyword co-occurrence analysis (2015–2024). This table summarizes the thematic structure derived from the co-occurrence network of 81 high-frequency keywords extracted from non-China-affiliated literature review publications. The seven clusters emphasize a broader engagement with Sustainability, digital transformation, educational technology, and innovation management. The findings suggest a relatively wider thematic dispersion and more substantial alignment with SDGs, Industry 4.0, and research evaluation methodologies.

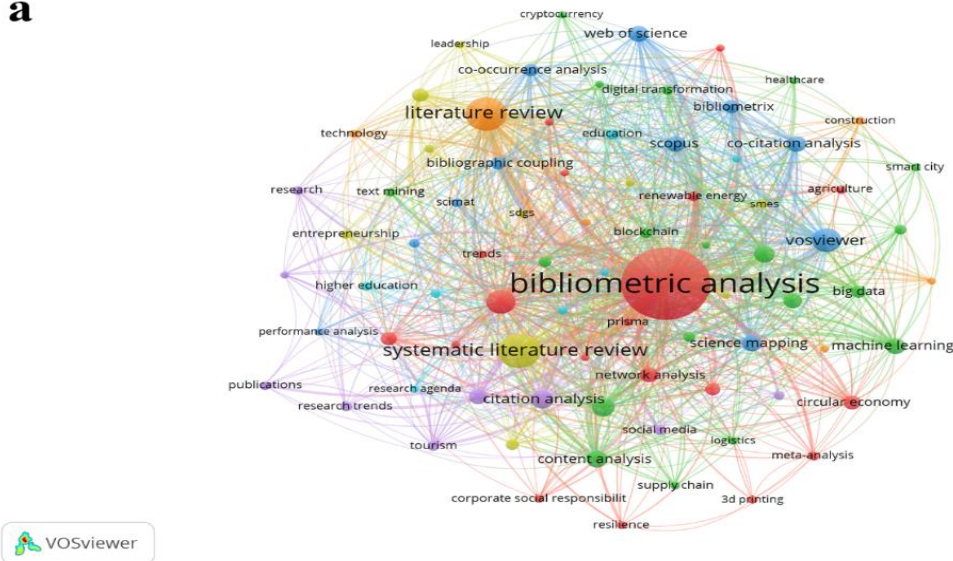
Cluster no.	Keywords	Thematic cluster	Conceptual themes
1	3D printing, agriculture, bibliometric analysis, circular economy, climate change, corporate social responsibility, energy efficiency, environment, ethics, intellectual structure, meta-analysis, network analysis, PRISMA, renewable energy, resilience, Sustainability, sustainable development, trends, wastewater treatment	Sustainability, Environmental policy, and Structural analysis	Emphasizes sustainability transitions, environmental frameworks, and the structural mapping of scientific knowledge using bibliometric approaches
2	Artificial intelligence, big data, blockchain, content analysis, COVID-19, cryptocurrency, deep learning, digital transformation, digitalization, healthcare, industry 4.0, internet of things, logistics, machine learning, pandemic, smart city, supply chain, supply chain management, text mining	Technological innovation and digital transformation	Captures the surge of bibliometric applications in digital innovation, pandemic-related technologies, and advanced logistics systems
3	Bibliographic coupling, bibliometrix, co-citation analysis, co-occurrence analysis, knowledge management, performance analysis, science mapping, SciMAT, Scopus, VOSviewer, Web of Science	Bibliometric techniques and mapping tools	Centers on methodological sophistication and the use of analytical software for mapping scientific landscapes and citation structures
4	Entrepreneurship, gender, innovation, leadership, management, open innovation, SDGs, SMEs, sustainable development goals, systematic literature review	Strategic management, innovation, and SDG alignment	Links innovation studies and organizational research with bibliometric analysis of sustainable development and global goals
5	Citation analysis, hospitality, publications, research, research trends, scientometric analysis, social media, social network analysis, tourism	Social and sectoral research evaluation	Applies bibliometric tools to hospitality, tourism, and social research, with attention to publication dynamics and metric-based assessments
6	Augmented reality, e-learning, education, higher education, research agenda, thematic analysis, virtual reality	Educational technology and	Explores research agenda-setting, educational technology, and thematic

Construction, consumer behavior, digital technologies, environmental Sustainability, literature review, technology

research frameworks
Built environment, User-centric studies, and Technology outlook

methods in learning and higher education contexts
Focuses on applied bibliometric analysis of user experience, technological systems, and construction-sector innovation

a



b

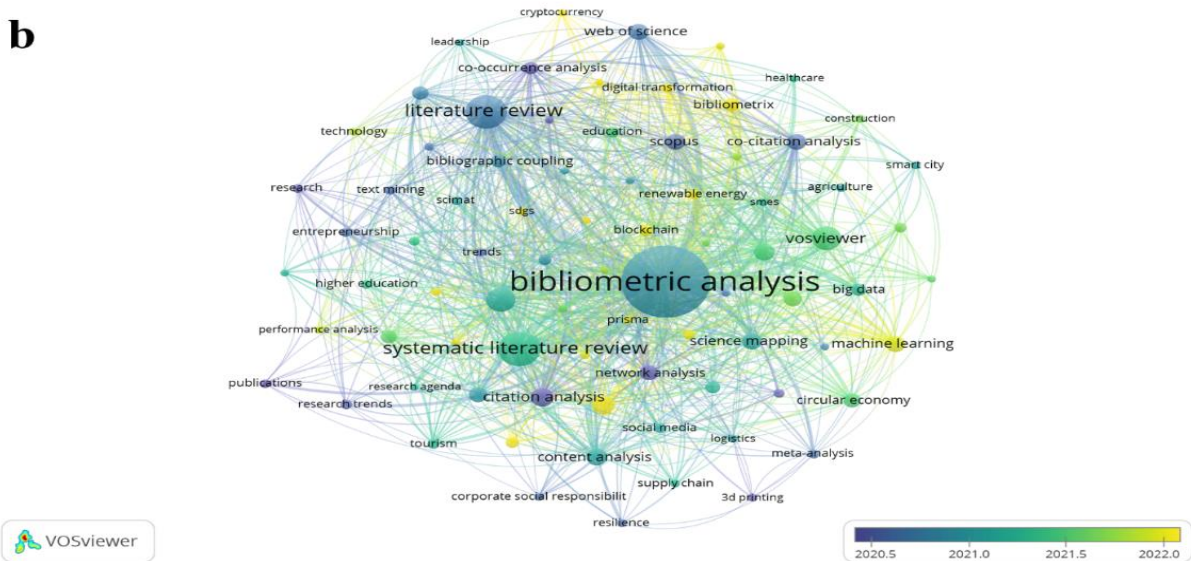


Figure 2. Co-occurrence network of keywords in non-China-affiliated literature review publications. Network visualization of keyword co-occurrence from the top-cited non-China-affiliated literature review publications. Panel (a) illustrates clustered thematic groupings, while panel (b) overlays the temporal evolution of keyword usage. Seven clusters emerge, reflecting a balanced distribution across bibliometric methods, digital innovation, environmental policy, and education. Notably, this group demonstrates greater thematic diversity, a more substantial presence of SDG-related themes, and integration of AI and IoT into literature review research.

3. Comparative Interpretation and Implications

Taken together, Figures 2 and 3 show that while both groups use bibliometric tools to explore trends and map scientific knowledge, their conceptual orientations diverge. China-affiliated studies demonstrate a dense, tool-centred, and often technically specialized approach, driven by national priorities in health and environmental Sustainability. In contrast, non-China-affiliated studies emphasize thematic breadth, interdisciplinary integration, and the strategic application of bibliometrics to innovation, education, and global development. These conceptual differences may partly explain the variation in methodological practices identified earlier in the study. For instance, the strong presence of CiteSpace in China-affiliated studies aligns with that community's preference for detailed structural analysis and health-related applications.

Meanwhile, the more narrative- and policy-oriented structure of non-China-affiliated studies may contribute to a broader—but sometimes less technical—range of methodological reporting styles. This analysis highlights the value of linking methodological behavior to conceptual structure. By doing so, it reveals not only what researchers' study but also how the purpose and focus of their work influence the way bibliometric methods are employed, adapted, and reported. It also underscores the need for reflexivity in bibliometric research, encouraging scholars to consider how disciplinary and regional contexts shape their methodological decisions.

Discussion

The co-word analysis reveals how thematic priorities may influence methodological behaviors. China-affiliated studies clustered around applied domains such as artificial intelligence, traditional Chinese medicine, and wastewater treatment—topics aligned with national priorities and industrial applications. In contrast, non-China-affiliated studies demonstrated a broader engagement with the SDGs, educational reform, and digital transformation, often supported by theory-driven frameworks. These differences are not merely topical but structural: applied topics may favor rapid, tool-driven analysis, while policy-relevant or interdisciplinary inquiries may demand greater methodological depth. Thus, conceptual orientations shape the form, function, and transparency of bibliometric methods. This finding aligns with Knorr-Cetina's notion of epistemic cultures [1]—that the way researchers construct and validate knowledge varies across communities and institutional settings.

Reference

- [1] K. K. CETINA, *Epistemic Cultures: How the Sciences Make Knowledge*. Harvard University Press, 1999. Accessed: Jul. 27, 2025. [Online]. Available: <http://www.jstor.org/stable/j.ctvxw3q7f>