

Mapping Leadership Dynamics in 2023: A Comprehensive Visualization Analysis of BRICS+ Nations

Huichan Ren and Suhaila Abdullah

School of Humanities, Universiti Sains Malaysia, 11800, Penang, Malaysia

Email: huichanren@gmail.com, aila@usm.my

To Link this Article: <http://dx.doi.org/10.6007/IJARBSS/v14-i1/20420>

DOI:10.6007/IJARBSS/v14-i1/20420

Published Date: 16 January 2024

Abstract

This study investigates leadership research in BRICS+ nations in 2023, with a primary focus on uncovering China's substantial influence and contributing insights to the academic landscape of leadership studies. Utilizing VOSviewer 1.6.18(0), Scimago Graphica, and Excel software, the research employs bibliometric analysis to comprehensively depict the academic landscapes of leadership research in the BRICS+ nations. The findings underscore China's prominent role in the field, supported by 539 publications, and highlight the noteworthy contributions of academics such as Zhang X., Wang Y., and Li X. Additionally, the study emphasizes the impactful work of Cibula et al (2023) in cervical cancer care, attributing its success to authoritative references, frequent revisions, expert involvement, rigorous methodology, and extensive coverage. The main research themes encompass leadership styles, performance, impact, innovation, sustainability, and motivation, while the identification of current emphases on self-efficacy, sustainability, personality, and culture is expected to guide future research trajectories in the field of leadership studies.

Keywords: Leadership, BRICS+ Nations, Visualization Analysis, Vosviewer, Scimago Graphica, Excel Software

Introduction

Leadership development is a complex and diverse topic that involves a broad variety of concepts and skills, demanding thorough and detailed examination at different levels and in various domains (Day, 2011). Leadership research involves understanding patterns among individuals, organizations, teams, and even stronger collectives (Day et al., 2014). Leadership is essential for driving sustainable development projects (Mazutis & Abolina, 2019). For instance, sustainable leadership has a key function in promoting economic growth, long-term profitability, cost-effective innovation, environmental preservation, and social confidence (Hallinger & Suriyankietkaew, 2018; Iqbal et al., 2021; McCann & Sweet, 2014). In business operations, responsible leaders commonly demonstrate several beneficial behaviors, including creating shared visions and actively assuming social duties. These practices have a

significant impact on the sustainable performance of the company (Iqbal & Ahmad, 2021; Wang et al., 2022).

The BRICS nations have attracted significant interest from both the political and intellectual realms due to their considerable Gross Domestic Product (GDP) and growth rates (Leksiutina, 2017). Numerous scholars have conducted in-depth research on the BRICS nations, covering various aspects such as economics and trade (Boubaker & Raza, 2017; Ji et al., 2020; Maryam et al., 2018), environmental protection (Apergis et al., 2023; Appiah-Otoo & Acheampong, 2021; Danish et al., 2019), international relations (Lee, 2006; Niu, 2015), and political science (Niu & Hong, 2021; Verma & Papa, 2021). The BRIC group, including Brazil, Russia, India, and China, was formed in September 2006 and collectively represents 25% of the world GDP. In September 2010, the group acquired the name BRICS with the official inclusion of South Africa (Andreasson, 2011). In January 2024, Egypt, Ethiopia, Iran, Saudi Arabia, and the United Arab Emirates joined the group, formally expanding its membership (Rédaction Africanews, 2024). Hence, the term BRICS+ has been considered more precise and appropriate to designate this enlarged alliance (López, 2023). The enlargement of these new members is anticipated to enhance the group's influence on the world stage.

Utilizing visualization to analyze intricate data is a highly successful approach. Visualization analysis not only encourages the formulation of novel ideas but also offers readers a basis for objective observation and assessment (van Wijk, 2005). Analyzing the academic contributions of countries provides the evaluation of their research activity levels and scientific capacities in particular areas (Li, 2023b; Zyoud, 2021). Concurrently, acknowledging the contributions of particular authors on a certain subject might aid in identifying experts in that field and establishing the basis for academic cooperation (Akbari et al., 2020). Highly cited publications hold significant academic value and impact within specific subjects. Examining such texts provides a deeper comprehension of the evolutionary trajectories and fundamental principles of the academic region (Chander et al., 2022). Co-occurrence keyword analysis is a commonly used technique in bibliometric analysis (Gorzeń-Mitka et al., 2020). Using this approach, researchers may analyze the structure and patterns of the specified study dataset, leading to a thorough comprehension (Li, 2023a).

This article provides a thorough examination of leadership studies conducted in the BRICS+ nations in 2013, focusing on four key aspects: high-contributing nations, prolific authors, highly cited documents, and co-occurrent keywords. By exploring these four dimensions, researchers may gain a more thorough comprehension of the academic landscape of leadership research in the BRICS+ nations. This contributes significant insights to the academic community and politicians, promoting the thorough advancement of leadership studies.

Research Methods and Data Collection

Research Methods

VOSviewer as a tool for the comprehensive examination of clustering solutions utilizing visualization (Hassan-Montero et al., 2022; Vasudevan et al., 2016). Scimago Graphica is a specialized tool created to facilitate data visualization and exploratory research (van Eck & Waltman, 2017). Excel software is a robust visualization tool that can immediately create maps from input data (Au & Rischpater, 2015). This study primarily utilizes VOSviewer 1.6.18(0), Scimago Graphica, and Excel software for conducting bibliometric analysis and generating literature knowledge graphs.

Data Collection

The research data in this study are collected from the Web of Science database. The selection criteria for research data include the following: the topic (leadership), publication year (2023), countries (China, South Africa, India, Russia, Brazil, Argentina, Egypt, Ethiopia, Iran, Saudi Arab, and United Arab Emirates), all open access (open access), and language (English). After careful evaluation, the researchers selected a total of 1293 documents that met the requirements of being both highly and important. These documents were chosen specifically to conduct thorough visualization and analysis.

Figure 1 illustrates the document types that have been chosen according to the criteria. The dominant type is “article”, consisting of 1161 items, or approximately 90% of the overall document count. Furthermore, there are 143 documents classified as “early access”, accounting for approximately 11% of the overall count. The type of “review article” has 102 records, making up approximately 8% of the total amount of documents.

The Web of Science index for the 1293 selected documents is provided in Table 1. The three Web of Science Index categories with the highest number of records, listed in descending order, were the social sciences citation index (SSCI), science citation index expanded (SCI-Expanded), and emerging sources citation index (ESCI). Approximately 48 percent (618 documents) came from the SSCI, while approximately 39 percent (505 documents) were obtained via the SCI-Expanded. In addition, approximately 31 percent (402 documents) of the publications were sourced from the ESCI. The reason for the abundance of leadership studies in SSCI publications may be traced to the strong focus on social sciences in the field of leadership study, which makes SSCI journals the principal platform for academic contributions in this field of study.

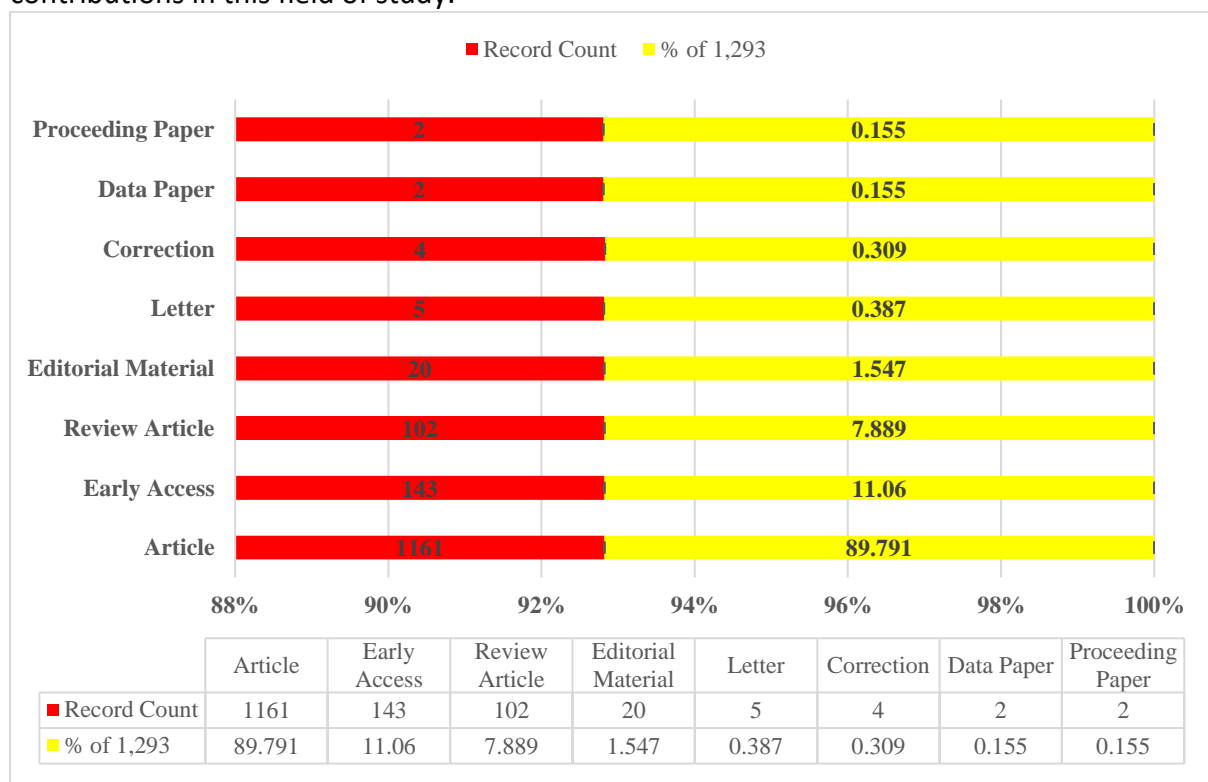


Figure 1: Document Types

Table 1

Web of Science Index

Web of Science Index	Record Count	% of 1,293
Social Sciences Citation Index (SSCI)	618	47.796
Science Citation Index Expanded (SCI-EXPANDED)	505	39.056
Emerging Sources Citation Index (ESCI)	402	31.09
Arts & Humanities Citation Index (A&HCI)	31	2.398
Conference Proceedings Citation Index – Science (CPCI-S)	1	0.077

Figure 2 displays the Web of Science categories with published documents exceeding 100. The field of Management boasts a substantial 155 publications, surpassing other topics. This sector constitutes approximately 12% of all publications. Among all academic fields, Environmental Sciences and Psychology Multidisciplinary have the second-highest number of publications (148 documents), or approximately 11% of the total. Environmental Studies has the third-highest publication volume, with 143 documents. This accounts for approximately 11% of the total. Green Sustainable Science Technology ranks fourth in publication volume, featuring 129 publications, contributing to approximately 10% of the total.

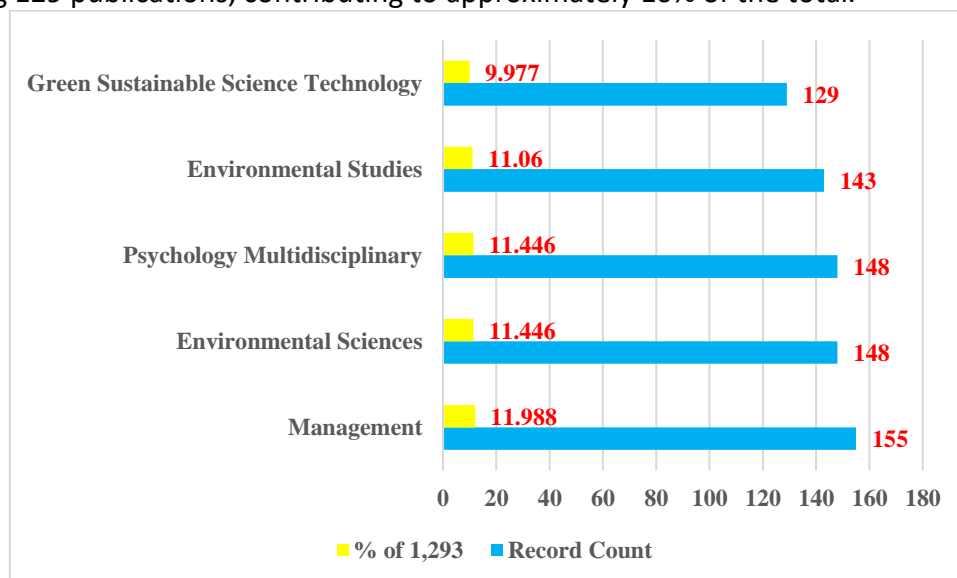


Figure 2: Web of Science Categories

Result and Discussion***Highly Contributing Countries Analysis***

Figure 3 displays the top 10 countries with the most research publications. It also includes clusters that represent citation linkages within the literature. The font size in the graph reflects the extent of the contribution to the literature. Larger font sizes correspond to a higher number of publications. China is in the top position with 539 publications while South Africa is in second place with 207 publications, and the United Kingdom is in third place with 175 publications. Additionally, Figure 3 depicts two distinct clusters denoted by various colors. The red cluster highlights 4 countries, namely China, Saudi Arabia, the United Arab Emirates, and Pakistan, indicating close citation relationships among the literature from these nations. The blue cluster, however, exhibits 6 countries (South Africa, the United Kingdom, the United States, India, Brazil, and Australia) indicating close citation relationships within the literature coming from these countries.

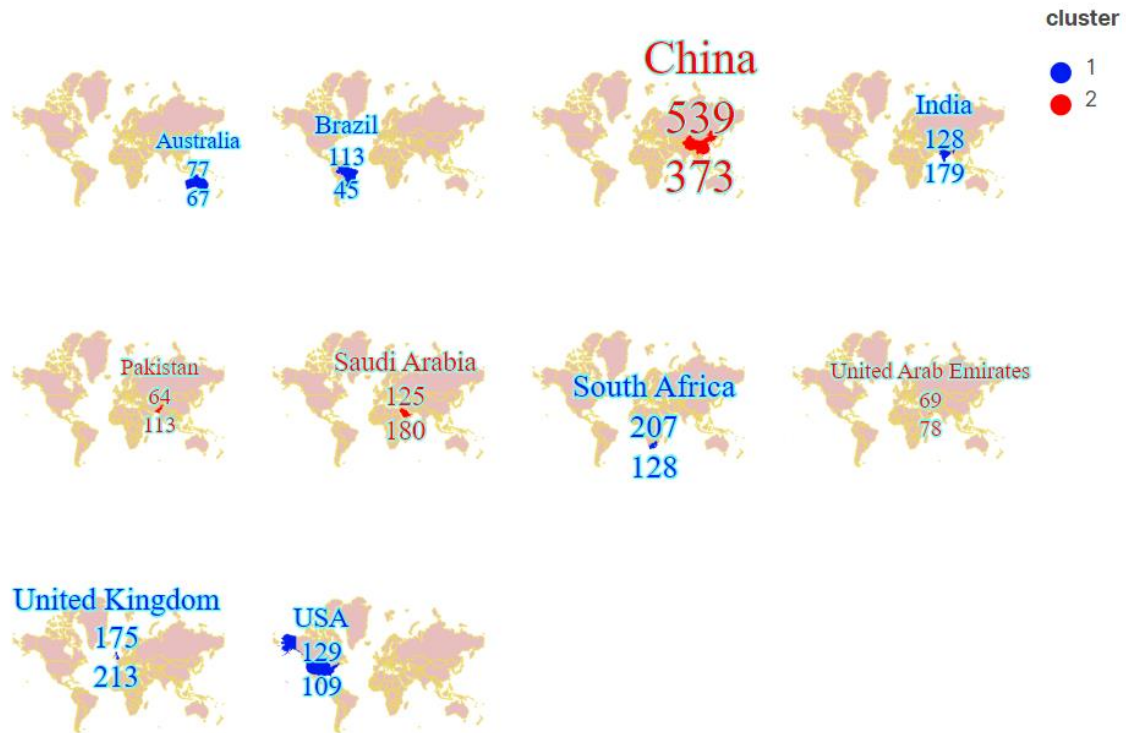


Figure 3: Countries with High Publication Volume and Strong Citation Relationship

Prolific Authors Analysis

Figure 4 depicts authors who have made significant contributions, with six or more publications in the field of leadership studies. Zhang L., a scholar, has published 10 documents that are relevant to this topic of Leadership. Wang Y. has produced a total of 9 relevant publications, while Li X. has contributed a total of 8 relevant papers. Jiang H., Li H., and Li M. have published 6 papers each. Hence, Zhang X., Wang Y., and Li X. have exhibited a deep fascination with leadership research, indicating a strong probability that they possess expertise in this field of study.

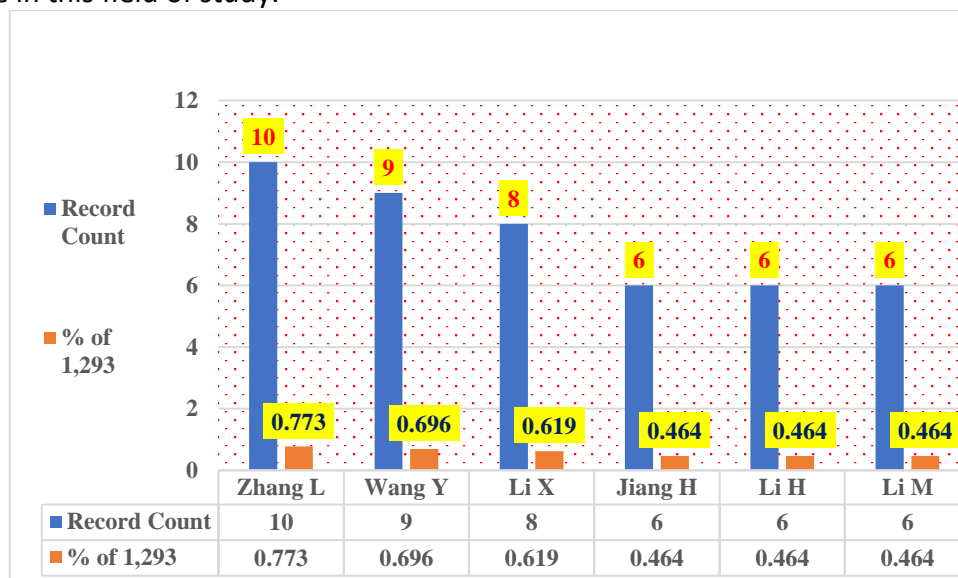


Figure 4: Authors and Contributions to Leadership Study

Highly Cited Documents Analysis

Table 2 highlights the top 5 cited leadership research papers in Web of Science. The research conducted by Cibula et al (2023) emphasizes the criteria established by the European Society of Gynecological Oncology (ESGO), in conjunction with the European Society for Radiotherapy and Oncology (ESTRO) and the European Society of Pathology (ESP), for selecting members involved in the management of cervical cancer patients. A prerequisite for team members is the possession of robust leadership and professional aptitudes. The study article by Rehman et al (2023) highlights the substantial impact of proficient leaders in small and medium-sized enterprises, specifically in domains such as culture, planning, control theories, incentives and pay, administrative control, and overall company success. Piwovar-Sulej and Iqbal (2023) performed an extensive examination of the correlation between leadership styles and sustainable performance. According to the analysis, academia places significant importance on sustainable leadership styles and transformative leadership styles. Furthermore, the research demonstrates a clear connection between sustainable leadership styles and sustainable performance, as well as a link between transformational leadership types and environmental performance. Alreahi et al (2023) highlighted that receiving suitable assistance from leaders plays a crucial role in successfully attaining predetermined objectives. Leadership and management are essential in the field of green human resource management methods. Compared to other literature, the high citation rate of the paper by Cibula et al. (2023) is likely attributed to its authoritative origin, continuous updates for relevance, involvement of an outstanding expert panel, rigorous methodology, and comprehensive coverage of various relevant topics in cervical cancer management.

Table 2

Top 5 Cited Leadership Research Papers in Web of Science

Author (year)	Title	Documents type	Citation
Cibula <i>et al.</i> (2023)	ESGO/ESTRO/ESP Guidelines for the management of patients with cervical cancer - Update 2023*	Article; early access	27
Bakker <i>et al.</i> (2023)	Daily transformational leadership: A source of inspiration for follower performance?	article	21
Rehman <i>et al.</i> (2023)	MCS package and entrepreneurial competency influence on business performance: the moderating role of business strategy	article	19
Piwovar-Sulej & Iqbal (2023)	Leadership styles and sustainable performance: A systematic literature review	review	18
Alreahi <i>et al.</i> (2023)	Green Human Resources Management in the Hotel Industry: A Systematic Review	review	13

Co-occurrence Keyword

Figure 5 displays the co-occurrence network of keywords in the leadership study. Researchers set the minimum co-occurrence of keywords to 35, which yielded a total of 30 eligible keywords. Figure 5 displays 4 distinct clusters, each identified by a different color. Cluster 1, marked in red, consists of 14 items. The most crucial keywords are performance (total line strength = 507, occurrences = 199), transformational leadership (total line strength = 356, occurrences = 142), and behavior (total line strength = 231, occurrences = 85). Cluster 2 is represented by 13 items in green. Leadership (total line strength = 563, occurrences = 320) is the most significant keyword. The second is impact (total line strength = 343, occurrences = 142), and the third is management (total line strength = 203, occurrences = 118). Cluster 3, marked in blue, comprises 2 items. Keywords include innovation (total line strength = 165, occurrences = 65) and sustainability (total line strength = 90, occurrences = 38). Cluster 4, marked in yellow, consists of 1 item. The keyword is motivation (total line strength = 87, occurrences = 35). Examining the primary keywords within each cluster, Cluster 1 predominantly focuses on the relationship between leadership styles and performance. Cluster 2 focuses the study on leadership and its impact. Cluster 3, the emphasis lies on exploring the relationship between leadership and innovation as well as sustainability. The main research topic of cluster 4 likely revolves around the motivation aspect of leadership. The study directions provide a coherent and organized framework, facilitating comprehension of the unique contributions of each cluster in the field of leadership studies.

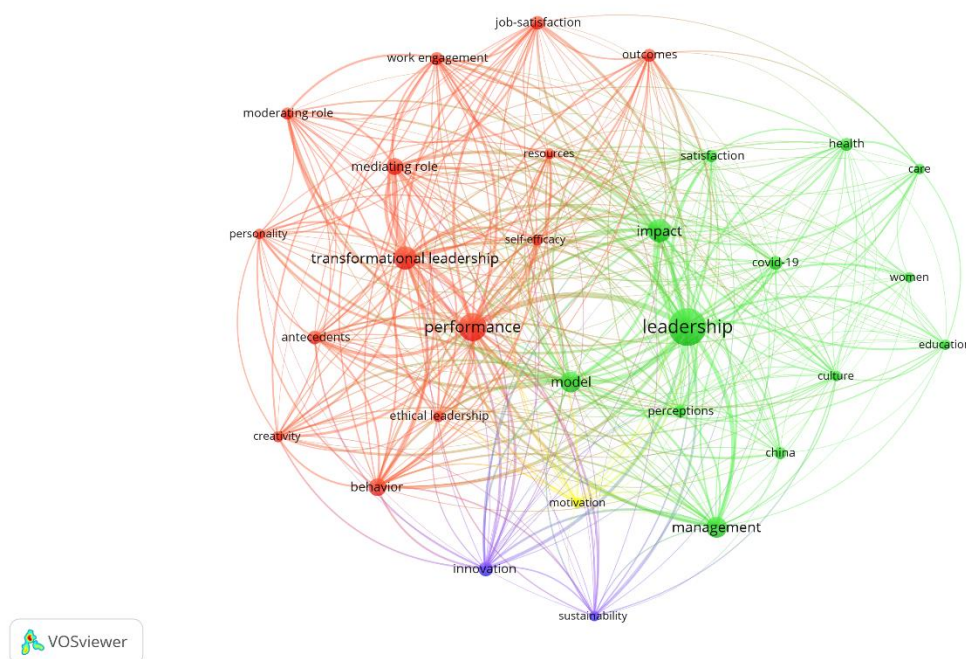


Figure 5: Keyword Co-occurrence in the Network of Leadership Studies

Figure 6 illustrates the co-occurrence overlay network of leadership studies. Utilizing the overlay network, researchers identified five recent popular terms: self-efficacy (occurrences = 40, Avg. pub. year: 2023.05), sustainability (occurrences = 38, Avg. pub. year: 2023.03), personality (occurrences = 37, Avg. pub. year: 2023.03), cultural (occurrences = 37, Avg. pub. year: 2023.03). Based on the analysis of the latest trending keywords presented in Figure 6, it can be deduced that the current areas of focus in leadership research are centered

on topics such as self-efficacy, sustainability, personality, and culture. These topics are expected to emerge as prominent trends in study in the years to follow.

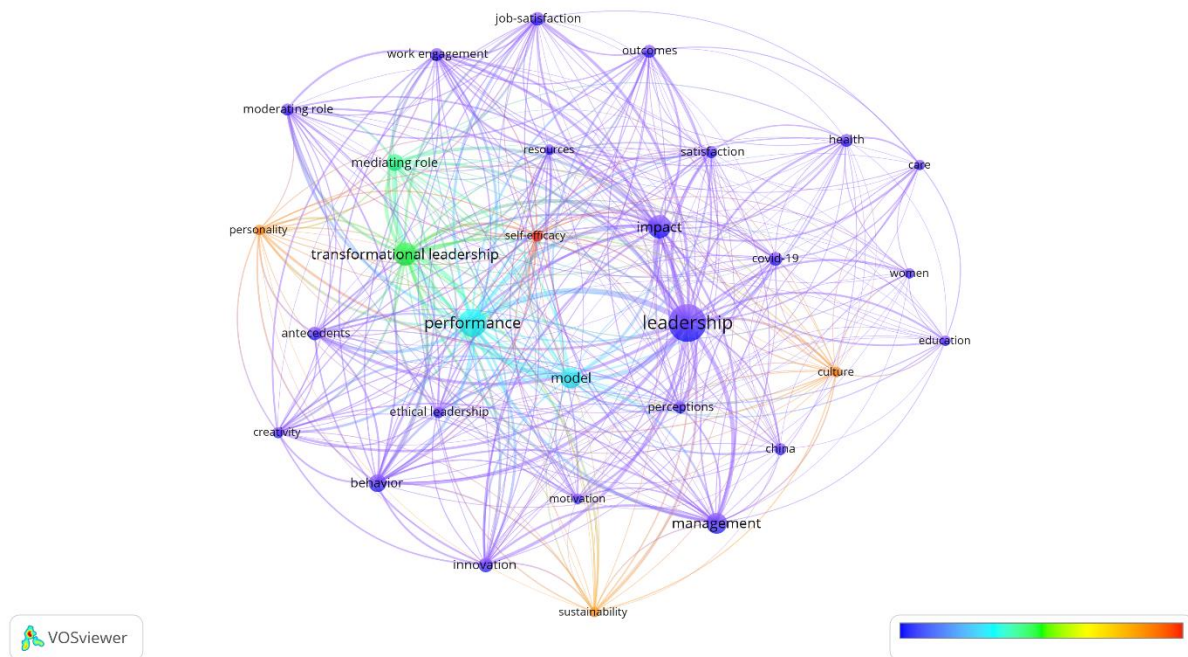


Figure 6: Keyword Co-occurrence in the Overlay Network of Leadership Studies

Conclusion

China leads in leadership research with 539 publications, showcasing its significant impact. The close citation relationships among literature from specific countries emphasize the global interconnectedness of leadership studies. Noteworthy scholars, such as Zhang X., Wang Y., and Li X., have made substantial contributions. The high citation rate of Cibula et al. (2023) is attributed to its authoritative origin, continuous updates, outstanding expert panel participation, rigorous methodology, and comprehensive coverage of various aspects of cervical cancer management. In 2023, the BRICS+ nations have explored four main topics in leadership studies, covering “leadership styles and performance”, “leadership impact”, “innovation and sustainability”, and “motivation”. However, the current focus on self-efficacy, sustainability, personality, and culture in BRICS+ nations is anticipated to shape future research directions. This comprehensive analysis provides valuable insights into the dynamic development of leadership studies.

Although our assessment of the current state of leadership studies in the BRICS+ nations is considered accurate, it's important to acknowledge that relying exclusively on the Web of Science database for data collection might have constrained the scope of our study. In subsequent phases, researchers are encouraged to broaden this aspect to ensure a more comprehensive analysis.

Funding

The authors received no direct funding for this research.

Disclosure Statement

The authors (s) declare no potential conflicts of interest.

Acknowledgment

The authors thank the reviewers and the editor for their useful suggestions and comments.

Data Availability

Access to the datasets used in this article is limited since they were utilized under a Clarivate license and are therefore not publicly accessible. They can be found in Clarivate's Web of Science database (<https://www.webofscience.com/wos/alldb/basic-search>).

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