

Bibliometric Analysis of Global Engagement Research: Trends, Prolific Authors, and Impact in Environmental Science and Business & Economics Fields

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Abstract — Global engagement has become vital to academic research, particularly in economics and environmental science. This bibliometric analysis utilizes Scopus Analyze and VOSviewer to explore trends, prolific authors, and the impact of global engagement research in these fields, identifying research gaps in reputable international databases like Scopus. The study aims to provide insights into the implications of global engagement on society, economy, and environment. Data from 105 papers were collected, with reputable international journals being the dominant source. Findings indicate a rising interest in global engagement research from 2014 to 2023, with the United States leading in contributions, followed by the United Kingdom, Australia, and other countries. Themes prevalent in the research include education and sustainable development, focusing on cross-cultural learning experiences and the need for international cooperation to address global challenges. In environmental science, scholars explore sustainable development, the sustainable ocean economy, and the impact of economic growth on environmental sustainability, seeking to design effective strategies for green technologies and sustainable practices. This study's valuable insights contribute to business, economics, and environmental science, guiding future research and understanding global engagement's implications in various domains while identifying research gaps that offer opportunities for further investigation into novel aspects of global engagement.

Keywords: A bibliometric analysis, global engagement, environmental science, sustainable development, environmental sustainability

Abstrak — Keterlibatan global telah menjadi penting untuk penelitian akademik, khususnya dalam bidang ekonomi dan ilmu lingkungan. Analisis bibliometrik ini menggunakan Scopus Analyze dan VOSviewer untuk mengeksplorasi tren, penulis yang produktif, dan dampak penelitian keterlibatan global di bidang ini, mengidentifikasi kesenjangan penelitian di database internasional terkemuka seperti Scopus. Studi ini bertujuan untuk memberikan wawasan tentang implikasi keterlibatan global terhadap masyarakat, ekonomi, dan lingkungan. Data dikumpulkan dari 105 makalah, dengan jurnal internasional bereputasi sebagai sumber dominan. Temuan menunjukkan minat yang meningkat dalam penelitian terkait keterlibatan global dari tahun 2014 hingga 2023, dengan Amerika Serikat memimpin dalam kontribusi, diikuti oleh Inggris, Australia, dan negara lainnya. Tema-tema yang lazim dalam penelitian meliputi pendidikan dan pembangunan berkelanjutan, dengan fokus pada pengalaman belajar lintas budaya dan perlunya kerjasama internasional untuk mengatasi tantangan global. Dalam ilmu lingkungan, para sarjana mengeksplorasi pembangunan berkelanjutan, ekonomi laut berkelanjutan, dan dampak pertumbuhan ekonomi terhadap kelestarian lingkungan, berupaya merancang strategi yang efektif untuk teknologi hijau dan praktik berkelanjutan. Wawasan berharga studi ini berkontribusi pada bisnis, ekonomi, dan ilmu lingkungan, memandu penelitian masa depan dan memahami implikasi keterlibatan global dalam berbagai domain sambil mengidentifikasi kesenjangan penelitian yang menawarkan peluang untuk penyelidikan lebih lanjut ke dalam aspek baru keterlibatan global.

Kata Kunci: Analisis bibliometrik, keterlibatan global, ilmu lingkungan, pembangunan berkelanjutan, kelestarian lingkungan)

INTRODUCTION

Scholars have extensively recorded a strong link between productivity and international involvement in the last few years. Both plants and companies that engage in exports or, to an even greater extent, are affiliated with multinational enterprises tend to exhibit higher productivity than their purely domestic counterparts. Currently, a highly active research field is striving to document and gain deeper insights into this correlation between global engagement and productivity (Criscuolo et al., 2010).

Innovation represents a fundamental business competency, and thorough research investigates its significance in firms' strategies. Most studies categorize innovation into two types: process innovation, which involves enhancing existing processes and introducing new ones, and product innovation, which encompasses improving current products and introducing new ones to the market. Embracing innovation enables firms to improve their sustainability and expand in foreign and domestic markets. This becomes particularly crucial in an era of globalization, where competition intensifies, and consumer preferences rapidly change (Jang & Hyun, 2021).

Following implementing a comprehensive economic liberalization program in the 1990s, numerous developing nations have emerged as some of the most open economies to foreign trade and investment, securing their place among the world's ten largest economies. This substantial integration into the global economy has created favorable conditions and pressures for businesses in these developing countries to embrace the Internet. The purpose is to enhance coordination, expand market reach, and reduce costs to compete in the highly competitive national and international markets effectively (Palacios, 2006).

Moreover, these developing countries have played a significant role as a central production platform for subsidiaries of various multinational corporations (MNCs), with many of these MNCs operating as maquiladoras. This situation has been reinforced as these countries increasingly engage in international trade (Palacios, 2006).

Zhang et al. (2022) said globalization has significantly transformed our lives, fostering improved communication, rapid technological advancements, and increased innovation. It has led to economic growth and development, facilitating extensive channels for progress and fostering cultural exchange among diverse populations. However, globalization has also raised concerns, particularly regarding its environmental impact. Environmentalists have extensively discussed and highlighted the wide-ranging consequences of globalization on ecological systems and sustainability.

Zhang et al. (2022) said that due to globalization and industrialization, the introduction of various chemicals into the soil has led to the proliferation of noxious weeds and plants. The alteration of plants' genetic composition by these toxic wastes has significantly damaged the environment (Shahzad et al., 2022; Song et al., 2022). This situation has put a strain on easily accessible land and water resources. In many regions, mountains are being carved to make way for tunnels or motorways, encroaching upon vast areas of desolate land for new constructions (Guo et al., 2021), which may attract people but also have adverse environmental consequences. Plastic, a non-biodegradable material, has emerged as a significant pollutant in various studies (Sharma et al., 2021).

Conversely, plastic is precious for packaging and preserving products for export, leading to a significant increase in its usage and widespread contamination. New measures and approaches are being explored in this field, including economic complexity (Gozgor, 2018), economic growth (Apergis et al., 2018, 2018), export diversification (Gozgor & Can, 2016), export quality (Gozgor & Can, 2017), and trade (Gozgor, 2017). However, researchers have yet to reach a consensus on the most suitable method to quantify globalization and its impact on environmental degradation in developing nations.

Adopting the United Nations Sustainable Development Goals (UN SDGs) signifies a global policy agenda focused on attaining sustainable development targets by 2030. These 17 interconnected and inseparable goals are instrumental in addressing environmental issues within the context of global engagement. Among the SDGs is a crucial emphasis on the conservation and sustainable utilization of oceans, seas, and marine resources to foster sustainable development worldwide (Hassanali, 2020).

In light of the extensive research on the vital link between productivity and international involvement and the growing importance of global engagement in various fields, significant research gaps warrant further investigation. Despite the increasing interest in the subject, more focused research is needed, particularly in reputable international databases like Scopus. These research gaps present valuable opportunities for scholars to explore novel aspects and untapped dimensions of global engagement in their respective fields.

While global engagement has garnered significant attention in academic research, research gaps still warrant further investigation. Despite the growing interest in the subject, there needs to be more research on specific aspects of global engagement, especially in reputable international databases like Scopus. These gaps offer valuable opportunities for scholars to delve into novel aspects and explore untapped dimensions of global engagement in various fields.

The limited research on specific dimensions of global engagement poses challenges in fully

understanding the complexities and implications of this phenomenon. As the world becomes increasingly interconnected, it is imperative to address these gaps to understand the opportunities and challenges posed by global engagement in different sectors.

This study aims to address the research gaps in global engagement by conducting a comprehensive bibliometric analysis using the Scopus database. The analysis will focus on business, economics, and environmental science research. By employing bibliometric analysis with VOSviewer, the study seeks to identify patterns, trends, and themes in the published literature related to global engagement, providing valuable insights for researchers, practitioners, and policymakers.

Based on the background, the formulation of this research is as follows: (1) What are the dominant themes and trends in research related to global engagement in business, economics, and environmental science? (2) Which countries and institutions are leading in global engagement research, and what are their contributions to the existing body of knowledge? (3) How has the interest in global engagement research evolved over the years, and what are the implications of the observed trends? (4) What are the critical areas of research that require further exploration in global engagement, and how can these gaps be addressed to advance the field's understanding?

By addressing these research questions, this study aims to contribute valuable insights to business, economics, and environmental science, guiding future research endeavors and fostering a deeper understanding of the implications of global engagement in various domains.

METHODOLOGY

Research Process

The steps for conducting bibliometric analysis, along with the corresponding guidelines, are as follows:

Step 1: Defining the Aims and Scope of the Bibliometric Study. In this initial step, researchers must clearly define the aims and scope of the bibliometric study. This process precedes the selection of bibliometric analysis techniques and data collection. It is essential to have a well-defined focus and research questions to guide the subsequent steps effectively.

Step 2: Selecting the Techniques for Bibliometric Analysis. The second step involves designing the bibliometric study by selecting appropriate techniques for analysis that align with the study's aims and scope, as defined in the first step. Researchers need to

identify the most suitable tools and methodologies to achieve the intended objectives of the study.

Step 3: Collecting Data for Bibliometric Analysis. During the third step, researchers gather the necessary data for the chosen bibliometric analysis techniques identified in the second step. This involves defining search terms that yield results significant enough to warrant bibliometric analysis while remaining focused within the dedicated research field or the scope outlined in the first step.

Step 4: Conducting the Bibliometric Analysis and Reporting Findings. The fourth and final step involves running the bibliometric analysis and presenting the findings. The analysis process and the generation of its accompanying summary are generally considered as separate steps. In this phase, researchers analyze the collected data using the chosen bibliometric techniques and then report their findings clearly and concisely.

By following these steps and adhering to the specific guidelines tailored to their research questions, scholars can conduct a comprehensive bibliometric analysis that contributes valuable insights to their field of study (Donthu et al., 2021).

Data Sources

The data for this research, utilizing bibliometric analysis, was extracted from the Scopus database using three specific keywords: "global engagement", "global engagement" AND "innovation", and "industrial globalization". In total, there were 105 papers retrieved, categorized as follows: 49 articles from reputable international journals, 28 book chapters, 8 conference papers, and the remaining consisting of 5 books, as well as editorial pieces, notes, reviews, and short surveys (see Table 1).

Method

The research employs bibliometric analysis with Scopus Analyze and VOSviewer, a powerful software tool for visualizing and analyzing bibliometric networks (Fan et al., 2023). Donthu et al. (2021) explain that bibliometric analysis has recently experienced a surge in popularity within the field of business research. This popularity can be attributed to two main factors. Firstly, there have been significant advancements in bibliometric software, such as Gephi, Leximancer, and VOSviewer, and the increased availability and accessibility of scientific databases like Scopus and Web of Science. These tools have made it easier for researchers to perform bibliometric analyses effectively and efficiently. Secondly, there has been a cross-disciplinary exchange of ideas, where the methodology of bibliometric analysis from information science has

been integrated into business research, leading to its wider adoption.

The growing popularity of bibliometric analysis in business research is not merely a passing trend but a reflection of its practicality in handling substantial volumes of scientific data. Moreover, this methodology has proven its ability to generate research with high impact, making it an indispensable tool for researchers seeking to navigate and understand vast amounts of scholarly information and its impact within the business domain (Donthu et al., 2021).

This method allows for a comprehensive examination of the research literature related to the topic of interest, “global engagement”. The analysis involves retrieving data from the Scopus database using specific keywords, namely “global engagement”, “global engagement” AND “innovation”, and “industrial globalization.”

FINDINGS

In the Scopus database, 105 articles focusing on global engagement were identified and recorded, as shown in Table 1 and Figure 1. Among these publications, articles from reputable international journals were the most dominant, accounting for 49 papers. Additionally, there were 28 book chapters, 8 conference papers, and the remaining publications included 5 books and editorial pieces, notes, reviews, and short surveys. This distribution highlights the prevalence of research published in esteemed journals, indicating a strong interest and recognition of the topic within the academic community.

Table 1. Analyze by Type on Global Engagement

DOCUMENT	TYPE
Article	49
Book Chapter	28
Conference Paper	8
Book	5
Editorial	5
Note	5
Review	4
Short Survey	1
Total	105

The comprehensive collection of 105 articles about global engagement in the Scopus database reveals a diverse range of scholarly outputs across various document types. The prominence of articles in reputable international journals underscores the significance of the research conducted in this area. Additionally, including book chapters, conference papers, and other forms of publications further enriches the literature, offering a comprehensive understanding of global engagement from different

perspectives. These findings are essential for researchers and practitioners seeking to explore and delve into the complexities of global engagement as a subject of academic interest and practical significance.

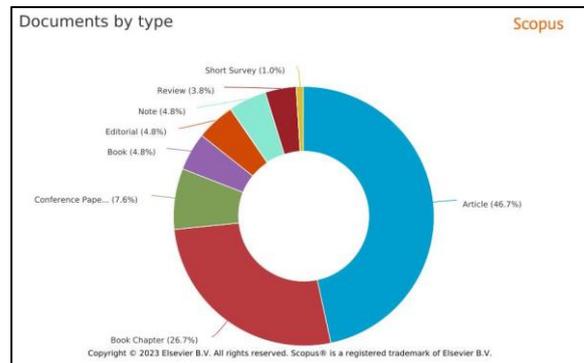


Figure 1. Scopus documents by type (2023)

Global Engagement Publishing Trends

The analysis of the Scopus database, as depicted in Figure 2, reveals a significant surge in global engagement research starting from 2014, with 11 published documents. However, in 2015, there was a decline, with only five documents published, but this trend rebounded in 2016 with a rise to 10 documents. Subsequently, the number of publications fluctuated over the following years, reaching ten documents again by 2022. As of July 2023, there are still three documents that are likely to undergo further updates and potential increase. These findings indicate that research focused on global engagement remains relatively scarce; however, it has been experiencing a consistent upward trend year by year. This information is valuable for researchers, as the limited number of studies in this area, especially those recorded in reputable international databases like Scopus, suggests that global engagement remains intriguing for further investigation and presents opportunities for scholars to explore novel aspects.

The continuous growth in research related to global engagement, as demonstrated by the increasing number of publications over the years, signifies the evolving interest and importance of this subject within the academic community. Despite the relative scarcity of research in this field, the consistent rise in the number of studies indicates a growing awareness of the significance of global engagement in various disciplines. As researchers continue to explore this topic, they will likely uncover new perspectives and contribute to advancing knowledge in global engagement. Furthermore, the availability of such data from reputable databases like Scopus is a valuable resource for scholars to identify gaps in the existing literature and direct their future research endeavors effectively. Overall, the upward trend observed in research related to global engagement

demonstrates its continued relevance and potential for further exploration in academia.

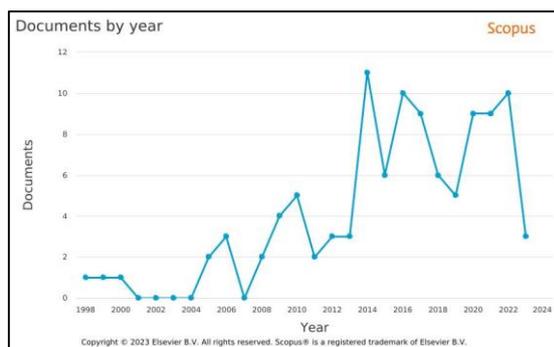


Figure 2. Annual scientific Production
Source: Scopus Analyze (2023)

The Origin of the Institution that Researches Global Engagement

Figure 3 and Figure 5 illustrate that researchers who have conducted studies and published research on global engagement are primarily dominated by scholars affiliated with universities in the United States. Among these institutions, Boston College stands out as the most prolific researchers on global engagement. Following closely in second place is the University of Nottingham, succeeded by Pennsylvania State University, University of Pennsylvania, Monash University, Michigan State University, Kenyon College, The University of Auckland, Western University, and Bellarmine University. The prevalence of researchers from these American universities suggests a strong interest and engagement in global engagement within the academic community in the United States.

The prominence of researchers from American universities in global engagement indicates the significant contributions made by scholars in this geographical region to the existing body of knowledge. Institutions such as Boston College and the University of Nottingham have demonstrated an exceptionally high level of engagement and dedication to conducting research and generating publications on this topic. This concentration of expertise from renowned institutions in the United States underscores the country's active involvement in studying and understanding global engagement from various perspectives. As these scholars continue to drive the research agenda, their work is likely to shape the future of this field, fostering valuable insights and advancements in global engagement.

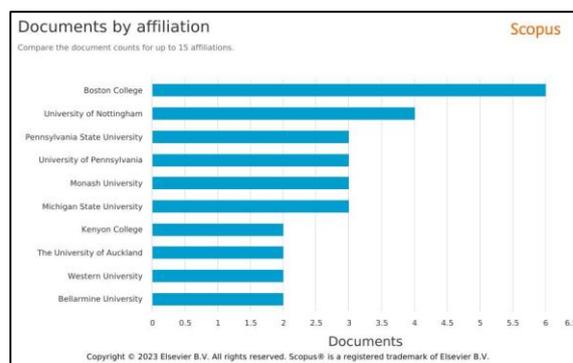


Figure 3. Scopus documents by affiliation
Source: Scopus Analyze (2023)

Most Prolific Researchers in the Field of Global Engagement

Figure 4 presents the top researchers who have significantly contributed to global engagement through their published research. Among these distinguished scholars, Brennan (2016; 2015), then Davidson (2016, 2017), Goldstein (2017, 2017), Guariglia (2010, 2008), Heyman (2016, 2017), Holroyd (2009, 2012), Jackson (2022a, 2022b), Johnston (2021, 2021), López (2021, 2021), and Davidson (2016, 2017).

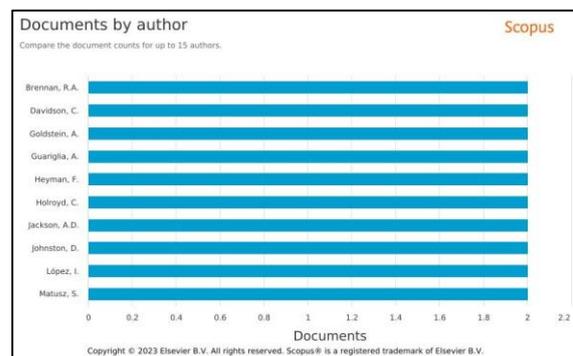


Figure 4. Scopus documents by author
Source: Scopus Analyze (2023)

These researchers, featured in Figure 4, have undoubtedly shaped the landscape of global engagement research with their impactful studies. Their extensive publication record over the years indicates their sustained dedication and dedication to exploring various aspects of global engagement. Their diverse research interests and contributions have expanded the scope of knowledge in the field, inspiring further investigation and inquiry by scholars worldwide. Their notable presence among the top researchers in the domain of global engagement signifies the value and significance of their work, serving as an invaluable resource for future studies and enhancing the collective understanding of this dynamic and multifaceted area of research.

Most Prolific Countries/Regions in the Field of Global Engagement

Among the research articles related to global engagement published in the prestigious Scopus database, the majority are conducted by researchers from the United States, contributing a substantial number of 60 publications, as evident in Figure 5. Following the United States, the United Kingdom secures the second position with 11 publications. Additionally, Australia has contributed 7 publications, Sweden with 6 publications, Canada with 5 publications, Germany with 4 publications, while both China and Indonesia have contributed 3 publications each. Moreover, Brazil and Ireland have each contributed 2 publications. This distribution highlights American researchers' dominance in global engagement research and emphasizes their active engagement in investigating various aspects of this critical area.

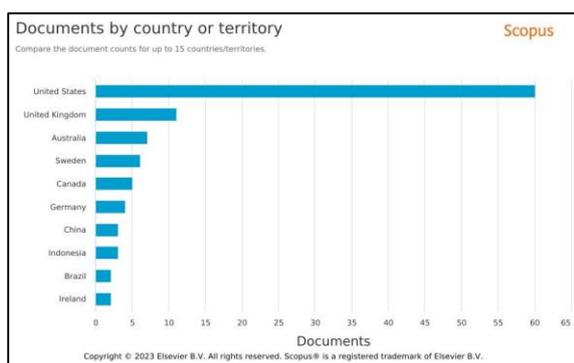


Figure 5. Scopus documents by country
Source: Scopus Analyze (2023)

The prevalence of research publications from American researchers in global engagement research showcases the country's significant involvement and commitment to contribute valuable insights to the academic discourse. The robust representation of the United States in Figure 6 indicates a prominent research culture that thrives on exploring global engagement from multiple perspectives. Simultaneously, the contributions from other countries such as the United Kingdom, Australia, Sweden, Canada, Germany, China, Indonesia, Brazil, and Ireland demonstrate a diverse international interest in this subject. The collaborative efforts of researchers from these nations have enriched the literature on global engagement, fostering a more comprehensive understanding of its intricacies and implications. The dissemination of research findings from this diverse group of countries fosters a global exchange of ideas, leading to a holistic approach to addressing challenges and opportunities related to global engagement.

Prolific Sources in the Field of Global Engagement

Figure 6 shows the top five reputable platforms that publish research related to global engagement, including *AIDS Education and Prevention*, *Johns Hopkins APL Technical Digest Applied Physics Laboratory*, *ACS Nano*, *ACS Symposium Series*, and *Lancet*.

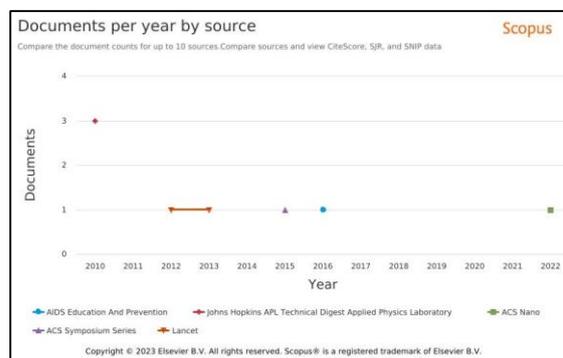


Figure 6. Scopus documents by sources or journals
Source: Scopus Analyze (2023)

Subject Area in the Field of Global Engagement

Figure 7 shows the subject area of research published in reputable sources, where the most dominant is in social science (38.6%), Economics, Econometrics and Finance (6.4%), Business, Management and Accounting (5.8%), Environmental Science (and the remainder in various other fields. The focus of this study focuses on research in the fields of business and economics.

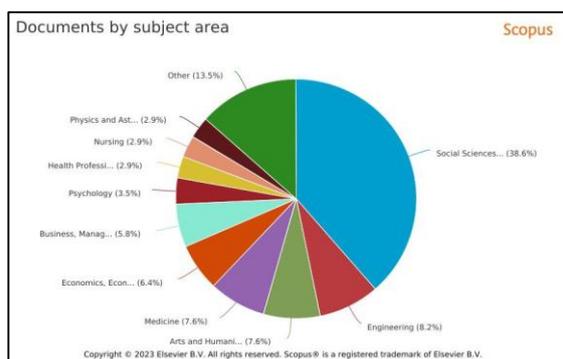


Figure 7. Scopus documents by subject area
Source: Scopus Analyze (2023)

Keyword Co-Occurrence Analysis on Global Engagement

Figure 8 provides an insightful depiction of the themes associated with global engagement across all subject areas. The visual representation showcases that research and publications related to global engagement are particularly prominent in education. Notably, themes such as online and distance

education, international student mobility, transnational education, global service learning, service learning, and global learning are prevalent within this domain. These topics reflect the significant attention given to exploring various aspects of education in the context of global engagement, highlighting the growing interest in understanding how educational practices can foster international collaboration and cross-cultural learning experiences. Additionally, Figure 9 reveals the emergence of themes such as SDGs (Sustainable Development Goals), sustainability, civic engagement, and global citizenship in the context of global engagement. These themes indicate the broader socio-economic and environmental dimensions associated with global engagement, showcasing a keen interest in exploring ways to address global challenges and promote sustainable development through international cooperation and civic participation.

The patterns observed in Figure 9 signify global engagement research's diverse and multifaceted nature across different subject areas. The concentration of research within the field of education underscores the importance of understanding and fostering global educational opportunities and experiences. Moreover, the appearance of themes related to SDGs, sustainability, civic engagement, and global citizenship reflects a growing awareness of the interconnectedness of global issues and the need for collective efforts to address them. This visualization is a valuable resource for researchers and policymakers, guiding their focus on key themes and areas of interest in global engagement. By delving into these prominent themes, scholars can contribute to developing effective strategies and policies that promote global collaboration, sustainable development, and active global citizenship.

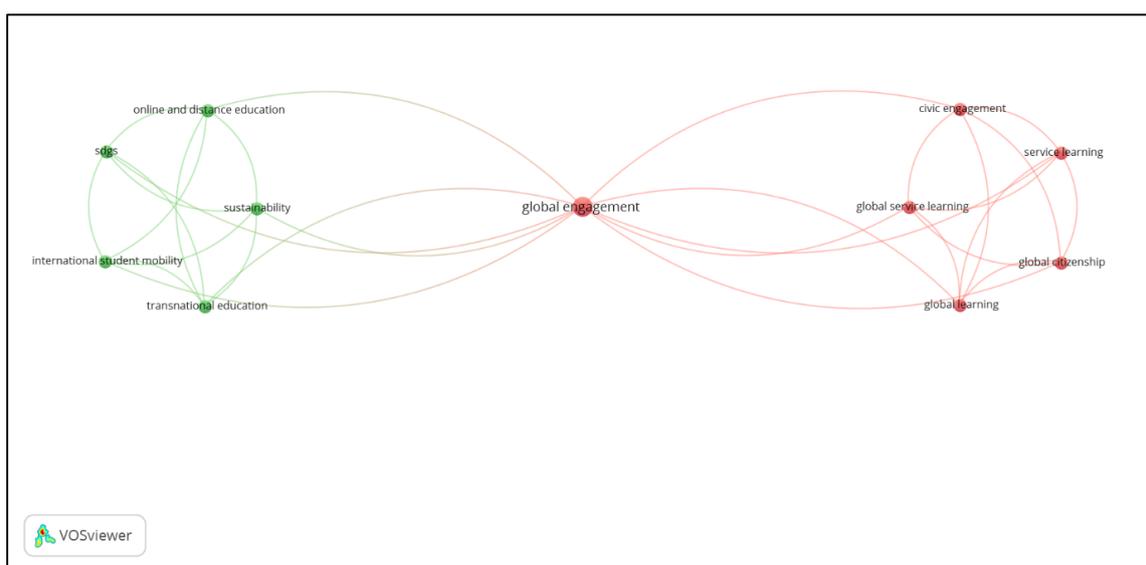


Figure 8. Co-occurrence by Author keywords

Global Engagement in the Field of Environmental Science

Figure 9 provides an insightful overview of Global Engagement research in the Environmental Science field. The figure showcases various prominent themes in this area of study. One of the central themes is sustainable development, which has become a critical focus for researchers seeking to address

environmental challenges while promoting economic and social well-being. The concept of a sustainable ocean economy, often called blue growth, has also gained significant attention in recent years. Scholars investigate how coastal and marine resources can be utilized sustainably, ensuring the long-term viability of these ecosystems while supporting economic growth.

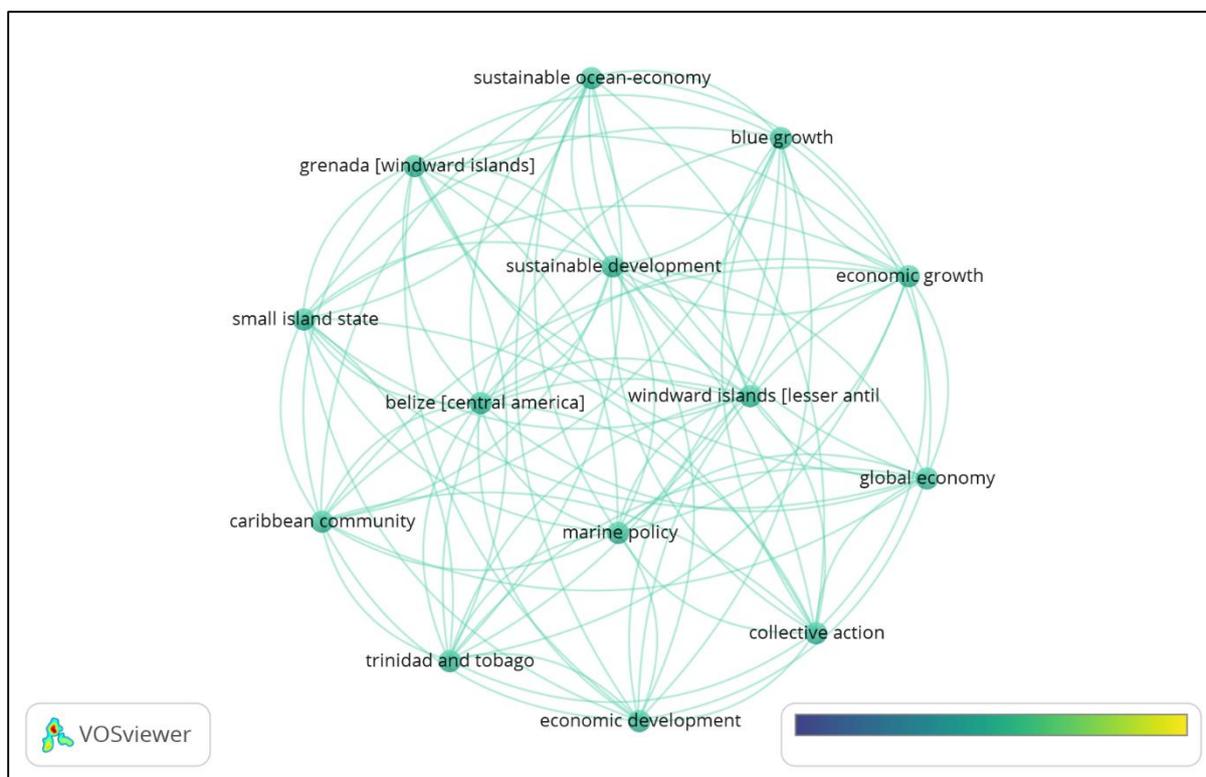


Figure 9. Co-occurrence by all keywords in the Field of Environmental Science
Source: VOSViewer Analyze (2023)

Additionally, the figure highlights research on economic growth and its connection to environmental sustainability. Understanding the relationship between economic development and environmental conservation is crucial for implementing policies that foster prosperity without compromising natural resources. Moreover, marine policy research explores formulating and implementing regulations that govern ocean resources, considering global economic factors and environmental protection. These themes collectively contribute to a comprehensive understanding of how global engagement in environmental science is pivotal in shaping sustainable economic development and effective environmental policies.

In addition to the themes mentioned earlier, Figure 10 reflects the breadth of research within Global Engagement in Environmental Science. Among the other noteworthy themes is examining the global economy and its impact on environmental sustainability. Researchers explore the complex interactions between economic activities and ecological systems globally, identifying opportunities for more sustainable practices. Moreover, the figure focuses on economic development, emphasizing how collective action and international cooperation can address environmental challenges. By understanding the potential for collaboration among nations and stakeholders, scholars seek to design effective strategies for mitigating environmental issues on a global level. The research also delves into interdisciplinary approaches that incorporate

environmental science into various economic sectors to foster green technologies and sustainable practices. As environmental concerns continue to be a pressing global issue, the research showcased in Figure 10 plays a vital role in guiding policymakers, businesses, and societies towards a more sustainable future.

DISCUSSION

The findings from the bibliometric analysis of global engagement research in the field of environmental science provide valuable insights into the prevalent themes and trends in this area of study. One of the central themes identified is sustainable development, which has emerged as a critical focus for researchers in addressing environmental challenges while promoting economic and social well-being. Scholars have recognized the importance of balancing ecological conservation with economic growth, and sustainable development has become a key consideration in shaping environmental policies.

Another significant theme that has gained substantial attention is the concept of a sustainable ocean economy, often called blue growth. This area of research explores how coastal and marine resources can be utilized sustainably to ensure these ecosystems' long-term viability while supporting economic growth. The growing interest in this theme indicates a recognition of the critical role of oceans and marine resources in the global economy and the need to manage them sustainably.

Furthermore, the analysis highlights research on the connection between economic growth and environmental sustainability. Understanding the relationship between economic development and environmental conservation is essential for policymakers to design effective policies that foster prosperity without compromising natural resources. Scholars seek to balance economic growth and environmental preservation by identifying opportunities for more sustainable practices.

The research in marine policy is another noteworthy theme within global engagement in environmental science. Scholars explore formulating and implementing regulations governing ocean resources, considering global economic factors and environmental protection. This research indicates the growing awareness of the need for international cooperation and collective action in addressing environmental challenges that transcend national boundaries.

The analysis also showcases the interdisciplinary nature of global engagement in environmental science, as it incorporates environmental considerations into various economic sectors. This approach seeks to foster green technologies and sustainable practices, emphasizing the importance of integrating environmental concerns into business and economic strategies.

Overall, the findings from the bibliometric analysis underscore the pivotal role of global engagement in shaping sustainable economic development and effective environmental policies. The identified themes reflect the growing interest in addressing global environmental challenges through international collaboration and cross-disciplinary approaches. Policymakers, businesses, and societies can benefit from these research insights in their efforts to create a more sustainable future and mitigate the impact of environmental issues on a global scale.

CONCLUSION

The bibliometric analysis of global engagement research in environmental science provides significant insights into this study area's prevalent themes and trends. Sustainable development emerges as a central theme, highlighting the importance of addressing environmental challenges while promoting economic and social well-being. The concept of a sustainable ocean economy, or blue growth, also garners considerable attention, emphasizing the need to utilize coastal and marine resources to support economic growth sustainably. Scholars recognize the vital role of oceans in the global economy and stress the importance of managing these resources for long-term viability.

Moreover, the analysis underscores the relationship between economic growth and environmental sustainability. Understanding this

connection is crucial for formulating policies that foster prosperity without compromising natural resources. The research on marine policy demonstrates the significance of international cooperation in regulating ocean resources and protecting the environment from global economic influences.

The interdisciplinary approach in global engagement research showcases the integration of environmental considerations into various economic sectors. Scholars seek to promote green technologies and sustainable practices, emphasizing the importance of harmonizing environmental concerns with business strategies.

The findings have significant implications for policymakers, businesses, and societies seeking to address environmental challenges and foster sustainable development. By understanding the prevalent themes and trends in global engagement research, policymakers can design effective policies that balance economic growth with environmental conservation. Businesses can explore opportunities for green technologies and sustainable practices, contributing to environmental sustainability while enhancing economic performance. Moreover, societies can recognize the importance of international collaboration in protecting the environment and advocate for collective action in addressing global environmental issues.

Despite its valuable insights, the bibliometric analysis has some limitations. The analysis relies on data from the Scopus database, which may only encompass some global engagement research in environmental science. Some publications might be excluded from the database, leading to potential gaps in the analysis. Additionally, the analysis might not capture emerging research trends that have yet to gain substantial visibility in the academic community.

To further advance the understanding of global engagement in environmental science, future research should explore emerging themes and trends beyond the scope of the current analysis. Researchers can conduct in-depth studies on specific aspects of sustainable development and the sustainable ocean economy, examining their implications for environmental conservation and economic growth. Moreover, studies on the effectiveness of international collaborations and collective action in addressing environmental challenges would benefit policymakers seeking to implement effective strategies.

Furthermore, future research can explore interdisciplinary approaches to environmental science and identify innovative ways to integrate environmental considerations into various economic sectors. Studying the adoption and impact of green technologies and sustainable practices in businesses would provide valuable insights for sustainable development efforts.

Overall, continued research in global engagement in environmental science is crucial for fostering a

more sustainable future and addressing pressing global environmental challenges.

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