

Research Trends in Communication Science in Southeast Asia Using the “Vosviewer” Application in Scopus-Indexed Journals

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ABSTRACT

This study aims to analyze research Trends in the field of communication sciences in Southeast Asia. The research methodology employed is bibliometric analysis using Vosviewer software. Bibliometric analysis is a method used to quantitatively measure and analyze scientific literature. Findings include the development of Trending research topics, patterns of collaboration among researchers, and the geographic distribution of author affiliations. Additionally, there is evident shifting of research focuses in line with contemporary developments and socio-political changes in the region. However, research Trends in Scopus indicate significant interdisciplinary synergy between communication sciences and fields such as nanotechnology, philosophy, and synthetic biology, which enhance both technology and understanding of communication. The conclusions of this study provide a comprehensive overview of research Trends in communication sciences in Southeast Asia. The results serve as a reference for researchers, academicians, and practitioners to understand the dynamics of research development and identify areas requiring further exploration in Southeast Asian context

INTRODUCTION

Scientific communication plays a crucial role in expanding the reach of research results and fostering productive exchange of information among the scientific community. Using analytical tools such as VOSviewer, we can visualize the network of connections between different research topics, allowing researchers to identify trends, knowledge gaps, and new collaboration opportunities. In addition to the scientific community, researchers also have an obligation to communicate their research results to the general public in a more understandable way. This can be done through popular articles, public seminars, or social media (Sidiq, 2019).

A scientific journal is a periodic publication that contains research articles, literature reviews, and other scientific thoughts. These journals usually go through a rigorous peer review process, where submitted articles are assessed by experts in the relevant field before being accepted for publication. Scientific journals are the main source for researchers to publish their findings and share knowledge with the scientific community (Sun & Yuan, 2020).

The obligations of scientists/researchers in scientific communication are very important to ensure that the knowledge produced can be widely disseminated, understood, and used by the scientific community and the general public. Researchers have an obligation to present their research findings and methodologies clearly and openly. Including presenting accurate data, thorough analysis, and ensuring transparency in reporting results (Tupan et al., 2018). One of the main obligations of researchers is to choose a reputable and trusted scientific journal for the publication of their research results. This ensures that their findings are accessible and trusted by the scientific community in the field of scientific communication.

The process of exploring research trends in the field of communication science in Southeast Asia, the use of analytical tools such as VOSviewer opens up new opportunities in understanding the dynamics of scientific communication, research results, and their impact on the development of science in the region. Scientific communication plays a central role in facilitating the exchange of ideas, knowledge, and findings among the academic community, and the use of VOSviewer on journals indexed in Scopus allows for a deeper dive into this (Van Eck & Waltman, 2010).

Overall, scholarly communication through scientific journals, especially those indexed in Scopus, is a major foundation in the dissemination of scientific knowledge and collaboration between researchers worldwide. By utilizing data contained in Scopus, this study aims to explore the current research trends in the field of communication science in Southeast Asia. Through this approach, we can identify the dominant research themes, collaboration patterns between researchers and institutions, and the contribution of scientific publications in enriching the understanding of communication in this region (Suhartika, 2012).

Webometric analysis is one of the important tools used to quantitatively measure the activity of a website (Shekofteh, 2016). Webometric studies are often also called quantitative analysis of a website. The relationship between webometrics and bibliometrics has long been the object of study in library and information science. The approach to reviewing various literatures with a mathematical and statistical approach is what is called bibliometrics. By considering the advantages of scholarly communication, the research results produced from this VOSviewer analysis can be a valuable resource for academics, practitioners, and policy makers who are interested in understanding and advancing the field of communication science in Southeast Asia.

The ranking of higher education in Indonesia in the early 2000s was closely related to the terminology of webometrics. This is related to the ranking of universities that determine the position or ranking of one university with another. Several universities in Indonesia are struggling in the ranking in the Webometric Ranking Of World University (WBWU), with the intention of being able to enter the cluster of world-class universities and colleges. This webometric is a great opportunity, meaning that the webometric ranking can be a means of self-portrait as well as promotion of universities. The key to the webometric ranking is how universities can increase the content (scientific papers) that are shared with the public in the index to search engines, and mobilize search engines to university sites through search engine optimization (SEO). This development is followed by the phenomenon of the web as a communication medium recorded in web format. Webometric analysis is one of the important tools used to quantitatively measure the activity of a website (Shekofteh, 2016). Webometric studies are also often called quantitative analysis of a website. The relationship between webometrics and bibliometrics has long been an object of study in library and information science. The approach to studying various literatures with a mathematical and statistical approach is called bibliometrics.

Bibliometrics is a branch of science that uses quantitative methods to measure, analyze, and evaluate the production of scientific literature and information in the form of publications or written works (Nandiyanto & Al Husaeni, 2021). Bibliometrics as a quantitative research method in scientific works is becoming increasingly important to measure the impact, popularity, and trends in scientific literature. By understanding the development of scientific literature, we can trace the evolution of thought, research trends, and significant contributions. This study shows how the development of research trends and describes the visualization map of topic literature or scientific literature in the Scopus database. The growing and developing science of communication shows the problems faced by novice researchers in mapping their research topics. Confusion and obstacles arise in finding reference sources, literature reviews, which are similar to previous research.

LITERATURE REVIEW

Bibliometrics has become an essential tool across disciplines due to its ability to map science and analyze scientific contributions across a broad spectrum. The number of academic publications is increasing rapidly, and bibliometrics provides a solution to manage and understand the growing stream of research. Aria and Cuccurullo (2017) noted that the rapid growth in scientific publications makes it difficult for researchers to keep up with all the published literature. Therefore, bibliometrics is key to providing an overview of research trends, research contributions, and relationships between topics in various scientific fields.

A science map, as described by Leydesdorff & Rafols (2012), is a symbolic representation of a scientific field or organization where map elements relate to a particular topic or theme. This science map can be created using bibliometric methods to highlight the relationships between topics, concepts, and contributors within a scientific field. This allows researchers to visualize scientific structures and identify research trends that may not be immediately apparent from reading individual publications.

The main focus is on visualizing and understanding how these elements are interrelated within a scientific framework. Hakim (2020) states that communication is the process of transferring understanding through the delivery of ideas or information from one individual to another. The transfer of understanding involves not only the words used in conversation, but also facial expressions, intonation, vocal emphasis, and other elements. According to Robert Bacal as quoted by Wandu et al., (2019), communication is an inseparable part of the management process, where through effective communication, harmonious cooperation can be developed to achieve common goals.

According to Bremholm in Dewiyana & Ariyanti (2009), bibliometrics is defined as the study of patterns in publication and document users. While bibliometric laws define predictable relationships in these patterns. In the context of this definition, bibliometrics examines publication patterns and document usage. According to Diadato in (Lu et al., 2021), bibliometrics comes from the word "biblio" or "bibliography" which means book, and "metrics" which means related to measuring. Therefore, bibliometrics can be interpreted as a tool for measuring or analyzing books and literature using a mathematical and statistical approach.

According to Pritchard as quoted by Habibi & Sulistyowati (2022), "bibliometrics is the application of mathematical and statistical methods to books and other media of communication." In other words, bibliometrics is the application of mathematical and statistical methods to books and other media of communication. Mackenzie & Knipe (2006) in their research stated that bibliometrics is a method that has a strong influence and is used as a tool to study the structure and pattern of author productivity in the context of scientific communication. In their research on scientific communication and bibliometrics, it was found that some aspects of scientific communication and bibliometrics were widely used, while others were initially only used for research purposes.

Research grouped by co-citation can provide insight into the intellectual structure of a field. It allows representing important groups of authors related to a particular topic (Nandiyanto & Al Husaeni, 2021). The most common units of analysis in scientific mapping are journals, papers, cited references, authors (author affiliations can also be used), and descriptive terms or words (Armaci et al., 2020). The use of citation and co-citation analysis was introduced to identify specific topics, such as Trending topics, which can be useful in designing R&D strategies (Darmawati, 2022). Different aspects of a research field can be analyzed depending on the unit of analysis chosen; for example, through the use of authors (co-author or co-authorship analysis), the social structure of a scientific field can be further analyzed (Naseer et al., 2019).

Traditionally, co-citation analysis studies have been limited to the first author of the cited references only, mainly due to the lack of data required to conduct an all-author analysis. Recent studies have confirmed that all authors reveal stronger co-citation clustering than the first author pattern alone. (Pranckute, 2021). Author co-citation analysis (ACA) can reveal the intellectual structure of a field from its academic publications by calculating the frequency with which two authors are cited together (Xie et al., 2020). Document co-citation analysis is defined as the frequency with which two documents are cited together by other documents. (Van Raan, 2000). DCA studies the network of references collected (Tanudjaja & Kow, 2018). A very important assumption is that co-citation clusters reveal the underlying intellectual structure. The idea that cited documents are symbolic is a concept introduced by (Subramanyam, 1983). He found a high degree of uniformity in how specific concepts and specific references to documents (cited documents) were associated in the communication literature.

METHODOLOGY

The research method used in this study is quantitative descriptive with a bibliometric analysis approach using Vosviewer software. Bibliometric analysis is a method used to measure and analyze quantitatively from scientific literature. Bibliometric analysis is used to identify research trends, patterns of collaboration between researchers, and developments in research topics in the field of communication science in Southeast Asia. Research data were obtained from the Scopus database using keywords related to communication science and the Southeast Asia region. Vosviewer is used to analyze data in the form of article titles, keywords, and author affiliations to identify research patterns that emerged in the period 2020-2023. Descriptive research is a type of research that aims to explain the value or characteristics of one or more independent variables without making comparisons or relationships between one variable and another (Sugiyono, 2017).

The keywords used in the data collection process are "Communication" and "Southeast Asia". Statistical and mathematical methods, as explained by Royani and Idhani (2018), are used to measure and analyze documents. Bibliometric analysis, as the main approach, is a research method that allows for comprehensive data analysis. This approach is useful in most productively, identifying institutions related to journal publishing, analyzing author publication sources, exploring scientific collaboration patterns, constructing topic density maps, and identifying the most frequently occurring keywords (Chen & Xie, 2020).

This method has the potential to form a systematic, transparent, and iterative review process. Thus, improving the quality of reviews can be achieved (Zupic & Čater, 2015). The software needed as an analysis tool for this study is vosviewer. This entire methodology is expected to provide a deep understanding of the development and contribution of communication science publications related to Southeast Asia in the international scenario.

The unit of analysis in research refers to a specific unit that is used as the subject of research (Arikunto, 2010). In the context of this research, the subject of this research is articles in the field of communication science in the Southeast Asia region during the period 2020-2023, which are obtained from the Scopus database. Mapping the field of communication science in Southeast Asia over a period of three years to be able to map the development of communication science. The number of studies to be used is 895 publications published between 2020 and 2023. Clearer information can be seen in the table below

Table 1. Unit of Analysis

No	Year	Document
1	2020	225
2	2021	200
3	2022	185
4	2023	285
	Total	895

RESULT AND DISCUSSION

Requirements (search terms) used to search for communication science concepts in Southeast Asia using the vocabulary contained in the Library of Congress Subject Headings (LCSH). LCSH is a controlled vocabulary used in all fields of science. The first edition of the Library of Congress was printed between 1909-1914 and is also known as the subject heading. Subject headings are used in the dictionary catalog of the Library of Congress. The second edition was published in 1919 where there was an additional list of additions according to needs. Subsequent editions were published periodically or irregularly. When the eighth edition was published in 1975 the title was changed to Library of Congress Subject Headings. The term communication in the Library of Congress Subject Heading is found with the term "Communication". The name of the country is also placed in the title of the country name such as "Indonesia" and "Southeast Asia". Furthermore, the terms obtained are matched with the terms used in the Scopus database. The matching results show that the terms "Communication" and "Indonesia" and "Southeast Asia" are also used as search terms in Scopus. Thus, the search terms used are "Communication" AND "Indonesia" AND "Southeast Asia". The use of Boolean logic "AND" is as a connector between several concepts or search terms in order to filter the search results to be more specific. Then the search results are carried out through the Scopus database using the term Communication "AND" Indonesia "AND" Southeast Asia which is included in all searches in the document, and is limited from 2020-2023, as seen in Figure 4.1 then how the results found are 895 documents.

Analysis and Identification of Research Trends in the Field of Communication Science in Southeast Asia Documented in Scopus Journals

Research trends are consistent and recurring patterns or directions in academic studies that can be identified over a period of time. These trends reflect the focus of hot topics, methodologies frequently used, and developments and changes in a particular field of study. Scopus is effective in helping researchers track, analyze, and visualize research from various disciplines. One of the areas studied is development economics, which is a part of economics that focuses on studying development issues that have, are, and will occur in developing countries. The emerging trends are found in the subjects of digital transformation in communication, crisis communication and disaster management, local media and culture, political communication and public participation, health communication, and the use of new media. Research visualization is a graphical representation of complex research data to facilitate understanding, interpretation, and analysis. In the context of communication science in Southeast Asia, these visualizations can include thermal maps, keyword networks, author collaboration graphs, and diagrams of institutions involved in the research.

Visualization of Research Results between Keywords, Authors, Institutions, and Wealth in the Field of Communication Science in Southeast Asia

During the process of producing a work, authors often collaborate. The network of author collaboration, in scientific publications in the field of communication science can be seen on the overlay visualization map, which can be divided into 1. clusters that have a collaboration network. This cluster shows the co-authorship that has been carried out by the author which is marked by the difference in color gradients in the visualization map as in Figure 4.9. On the co-authorship visualization map, the existence of author collaboration can be seen. According to Glanzer & Schubert, (2005) that co-authorship is one form of scientific collaboration that is real and well-documented. Figure 5.9 shows researchers who collaborate to produce documents with the largest number of 16 documents, including:

Table 2. Author

No.	Researcher	Document
1	abrizah, abdullah.	6
2	boukacem-zeghmouri, cherifa	6
3	herman, eti	6
4	nicholas, david	6
5	rodríguez-bravo, blanca	6
6	watkinson, anthony	6
7	xu, jie	6
8	ridwan, m.	6
9	sulaeman, sulaeman	6

This study also analyzes research institutions that research communication science in Southeast Asia. Table 4.2 below explains that Nanyang Technological University, Singapore obtained the top ranking with 337 citations.

Table 3. Organization

No.	Organization	Citation
1.	Wee Kim Wee School of Communication and Information, Nanyang Technological University, Singapura	337
2.	Department of Communication and Media, Faculty of Languages and Communication, Universiti Sultan Idris, Malaysia	115
3.	Universiti Utara Malaysia	29
4.	Universitas Negeri Yogyakarta	23
5.	Universiti of Malaya	6

Mapping Based on Co-Occurrence in Viewing the Subject of Communication Science (Add a Little Explanation That the 7 Keywords Below are the Subjects That Most Often Appear and Are Discussed During 2020-2023)

To clearly understand the distribution of communication science research hotspots in Southeast Asia, it is processed through the Vosviewer version 1.6.18 co-occurrence network analysis function, which obtains the distribution of communication science research hotspots in Southeast Asia. Table 4.7 displays the human keywords that occupy the top position from the results of the keyword co-occurrence analysis.

Table 4. Co-occurrence

No.	Keyword	Occurrence	Total Link Strength
1.	Human	51	394
2.	Communication	141	343
3.	Interpersonal Communication	39	235
4.	Article	42	334
5.	Social Media	59	141
6.	Human Experiment	15	140
7.	Covid-19	44	113

The table above shows the co-occurrence consisting of 7 clusters with a total of 116 items, as seen in the image below. The bibliometric network consists of nodes in the form of circles representing keywords, while edges (network nodes) represent the relationship between pairs of nodes. Mapping and clustering in bibliographic analysis using VOSviewer software are complementary and work together to provide more comprehensive information. Both work together to provide more comprehensive information. (ZakiyahWinoto, & Rohanda, 2022).

Communication Science research indexed in the Scopus database shows a consistent focus on a number of subjects that substantially dominate academic discourse from 2020 to 2023. Keyword analysis reveals that "Communication" appears as the most frequently researched topic, with 141 recurrences and a total strength link of 343, confirming the centrality of communication as a main pillar in this study. No less important, "Human" and "Social Media" also received significant attention, with 51 and 59 occurrences respectively, demonstrating the complex interaction between technology and humanistic aspects in contemporary communication.

Furthermore, "Interpersonal Communication" and "Human Experiment" emerged as important themes with substantial frequency of occurrence, indicating a deep interest in the dynamics of personal communication and human experimentation in the context of research. Meanwhile, the occurrence of "Covid-19" as many as 44 times signified a response to the pandemic situation that influenced the global communication paradigm. This topic underlines how the global health crisis affects communication practices, both in interpersonal contexts and through mass media.

Analysis of research trends in Communication Studies shows adaptation to contemporary issues by focusing on human interaction, the influence of social media, and adaptation to global emergencies such as the Covid-19 pandemic. This analysis emphasizes the importance of integrating multidisciplinary approaches and being responsive to changing social dynamics, marking a continuous evolution in communication studies.

This research represents elements marked with circles called "nodes" which mean the most common keywords (often appearing) in summarizing or re-presenting the contents of the titles or abstracts of the collected journal articles. The node size represents the number of scientific papers associated with the keyword, both the title and abstract of the paper. The larger the node size, the more relevant it is to the keyword. This means that the keyword is often used in articles as part of the search data collected. On the other hand, "edge" represents the connection between nodes and the strength of that connection. The shorter the distance between the nodes connected through the closer the relationship between nodes or keywords. This shows that related keywords are often used together in the same journal article (Aribowo, 2019).

Analysis of the Relationship between Communication Science and Other Fields of Science

This study focuses on the analysis of research trends in the field of Communication Science published in reputable journals in Scopus, using citation and network analysis software, VOSviewer. The main objective of this analysis is to identify and map the relationship between Communication Science and other disciplines that often appear in scientific works. Through a bibliometric approach, this study aims to provide a comprehensive picture of the dynamics of scientific collaboration and the development of research topics in the scope of Communication Science. The results of this analysis are expected to show how Communication Science integrates concepts and methodologies from various scientific fields, as well as provide insight into the direction and focus of current research in this discipline. Using VOSviewer, a tool that is able to visualize citation networks and collaborations between researchers, this analysis digs deeper into how Communication Science is interconnected with other fields such as sociology, psychology, information technology, and politics. The use of VOSviewer allows researchers to identify key keywords, trends, and collaborative relationships that underlie publications in Communication Science. From this analysis, it is expected that conclusions can be drawn about the dominant patterns of collaboration and research topics, as well as new potentials that can be explored for future studies. The following is the data obtained by the author from Scopus research in the 2020-2023 period:

The results of the VOSviewer analysis show that there is a significant relationship between communication science and nanotechnology, philosophy, and synthetic biology. This shows an important interdisciplinary synergy, where nanotechnology contributes to the development of increasingly miniature and efficient communication tools, while synthetic biology expands the understanding of communication at a fundamental biological level. Philosophy, on the other hand, offers an in-depth study of the ethical and epistemological implications of communication technology. This cross-disciplinary approach enriches communication science with a broader and deeper perspective, opening up new avenues for exploration and innovation in the way humans interact and understand information in an increasingly complex society.

The results of the VOSviewer seem to operate in relative isolation from communication science, reflecting the absence of significant interconnection between disciplines such as political science, biochemistry, and conservation science with communication studies. For example, biochemistry, which focuses on molecular and biological processes, rarely includes elements of communication in its studies, while conservation science focuses more on conservation practices and methodologies that do not directly correlate with communication theory or practice. This shows that, although communication is a fundamental element of human and social interaction, its application in some branches of science and technology is still limited, providing an opportunity for further exploration in uniting these disciplines through a communicative approach that may enrich cross-disciplinary understanding.

Trend of communication science research taken from the Scopus database and processed using Publish or Perish and visualized with VOSviewer, shows that the topic of Disorder Academic Training Program (1.61) is the most dominant theme. This shows significant attention to disruption in academic education, which is relevant in the context of educational communication. The theme of Art and Biochemistry (1.22) is also interesting, indicating the integration of art and science disciplines in communication studies, perhaps in terms of visual representation and scientific narratives. Meanwhile, concepts such as Science Self-Efficacy and Western Paradigm (1.22) show a focus on the perception of self-ability in science and criticism of the Western paradigm in the global communication landscape. In addition, the Science Policy Interface (1.06) shows the importance of the relationship between science and public policy, which requires a strategic communication approach. Other themes such as Computer Science and Environmental Science (1.06) strengthen the role of technology and environmental issues in modern communication research. The low relevance of the Gender Gap (0.00) indicates that research related to the gender gap in communication has not received adequate attention, reflecting a gap that needs to be filled in future studies. Overall, this trend indicates that communication science is currently increasingly interdisciplinary, involving various fields from science to art, with a growing focus on policy, technology, and the environment.

Between 2020 and 2023, research in the journal *Communication Science* showed a significant tendency to collaborate with various scientific fields, indicating a pattern of synergy and increasingly strong multidisciplinary evolution. Based on the analysis of the relevance of the resulting themes, *Communication Science* most often intersects with "Conservation Science" and "Disorder Academic Training Program," each with a relevance score of 1.61. This indicates a deep focus on conservation and education related to academic disorders in the context of communication (Kholil et al., 2024).

The conclusion of this discussion explains that research in *Communication Science* is growing, especially in the fields of conservation and education of academic disorders. Research in *Communication Science* is not only limited to theoretical aspects or media applications, but also tends to collaborate with disciplines such as "Art", "Biochemistry", and "Science Self Efficacy". This collaboration reflects a response to contemporary issues and the need to approach social and environmental problems with a broader communicative lens. Thus, *Communication Science* continues to adapt and integrate interdisciplinary approaches, underscoring the importance of communication in addressing global issues and supporting sustainability through innovation and effective education.

CONCLUSION AND RECOMMENDATION

Communication research trends in Scopus show significant connections between communication science and nanotechnology, philosophy, and synthetic biology, indicating interdisciplinary synergies that enrich approaches to communication, with contributions from nanotechnology in the development of communication technology, synthetic biology in the understanding of biological communication, and philosophy in ethical and epistemological aspects. Meanwhile, disciplines such as political science, biochemistry, and conservation science seem to operate in isolation, showing little or no significant interconnections with communication science, reflecting opportunities for cross-disciplinary integration and exploration that can further deepen understanding of communication in the context of these sciences.. For academics and researchers, it is hoped that this research can be a reference material that can inspire in conducting research in the field of communication science in Southeast Asia with Vosviewer with different applications and studies with a broader scope of communication science, for example intercultural communication, organizational communication, and conducting research in different locations which of course will provide different results.

REFERENCES

- Arpaci, Ibrahim, Al-Emran, Mostafa, & Al-Sharafi, Mohammed A. (2020). The impact of knowledge management practices on the acceptance of Massive Open Online Courses (MOOCs) by engineering students: A cross-cultural comparison. *Telematics and Informatics*, 54, 101468.
- Chen, X., Zou, D., Cheng, G., & Xie, H. (2020). Detecting Latent Topics and Trends in Educational Technologies over Four Decades Using Structural Topic Modeling: A Retrospective of All Volumes of Computer & Education. *Computers & Education*, 151, Article ID: 103855. <https://doi.org/10.1016/j.compedu.2020.103855>
- Darmawati, D. (2022). Description Of Keyword Analysis: A Bibliometric Study Of Interpersonal Communication. *Al-Ittizaan: Jurnal Bimbingan Konseling Islam*, 5(2), 86-92.
- Dewiyana, H., & Arianti, F. (2009). Produktivitas pengarang pada jurnal program studi di lingkungan Universitas Sumatera Utara (USU) terbitan USU Press Tahun 2004-2006.
- Fauzi, A., & Purwaningtyas, F. (2023). Analisis bibliometrik Trend penelitian jurnal iqra (jurnal perpustakaan dan informasi) periode 2017-2021 menggunakan vos viewer. *Jurnal Indonesia: Manajemen Informatika dan Komunikasi*, 4(2), 763-780.

- Habibi, F., Fitriana, A., & Sulityowati, E. (2022). Pemetaan Bibliometrik terhadap Perkembangan Penelitian E-Learning pada Google Scholar Menggunakan Vosviewer. *Attractive: Innovative Education Journal*, 4(2), 383-395.
- Hakim, L. (2020). Analisis Bibliometrik penelitian inkubator bisnis pada publikasi ilmiah terindeks Scopus. *Procuratio: Jurnal Ilmiah Manajemen*, 8(2), 176-189.
- Kholil, S., Ismail, I., Dalimunthe, M. A., Suhendar, A., & Rambe, R. F. A. K. (2024). Strengthening Religious Moderation through PTKIN and SIT Collaboration to Build Social Harmony. *JUPI (Jurnal Ilmu Perpustakaan dan Informasi)*, 9(2), 228-236.
- Lu, Ying, & de Vries, Walter Timo. (2021). A bibliometric and visual analysis of rural development research. *Sustainability*, 13(11), 6136.
- Leydesdorff, L. and Rafols, I., (2012). Interactive overlays: A new method for generating global journal maps from Web-of-Science data. *Journal of Informetrics*, 6(2), pp.318-332. DOI: <https://doi.org/10.1016/j.joi.2011.11.003>.
- Mackenzie, N. & Knipe, S. (2006). "Research dilemmas: Paradigms, methods and methodology." *Issues In Educational Research*, 16 (2), 193-205. Diunduh pada tanggal 27 September 2023 dari <http://www.iier.org.au/iier16/mackenzie.html>
- Nandiyanto, A. B. D., & Al Husaeni, D. F. (2021). A bibliometric analysis of materials research in Indonesian journal using VOSviewer. *Journal of Engineering Research*.
- Naseer, Mirza Muhammad, Waris, Abu, Ahmad, Shakil, Peter, Manuelraj, & Abdel- Magid, Isam Mohammed. (2019). A Bibliometric Study of Communications Published in *Journal of Informetrics* from 2012 to 2016. *Library Philosophy and Practice*.
- Pranckuté, Raminta. (2021). Web of Science (WoS) and Scopus: The titans of bibliographic information in today's academic world. *Publications*, 9(1), 12.
- Royani, Y., & Idhani, D. (2018). Analisis Bibliometrik Jurnal Marine Research in Indonesia. *Marine Research in Indonesia*, 25(4), 63-68.

- Shekofteh, M., Mohseny, M., Shahbodaghi, A., Zayeri, F., & Rahimi, F. (2016). The correlation among Y-index and other scientometric indicators. *Current Science*, 1823-1828.
- Sidiq, M. (2019). *Panduan analisis bibliometrik sederhana*. (June). DOI: <https://doi.org/10.13140/RG.2.2.15688.37125>.
- Subramanyam, K. (1983): "*Bibliometric studies of research collaboration: A Review*". Dalam : *Journal of Information Science*, Volume 6 :34.
- Suhartika. (2012). "*Karakteristik literatur bidang sosial dan politik: analisis sitiran terhadap karya ilmiah dosen Fakultas Ilmu Sosial dan Ilmu Politik Universitas Udayana*". Dalam: *Jurnal Kajian Informasi dan Perpustakaan*. Volume 1 (2012): 1-8.
- Sun, Jie, & Yuan, Bao Zhong. (2020). Mapping of the world rice research: A bibliometric analysis of top papers during 2008–2018. *Annals of Library and Information Studies (ALIS)*, 67(1), 55–66.
- Sugiyono. (2017). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta.
- Tanudjaja, I. and Kow, G.Y., (2018). Exploring Bibliometric Mapping in NUS using BibExcel and VOSviewer. IFLA WLIC Kuala Lumpur, 1–9.
- Tupan, T., Rahayu, R.N., Rachmawati, R. and Rahayu, E.S.R., (2018). Analisis bibliometrik perkembangan penelitian bidang ilmu instrumentasi. *BACA: Jurnal Dokumentasi Dan Informasi*, 39(2),pp.135-149.DOI: <https://doi.org/http://dx.doi.org/10.14203/j.baca.v39i2.413>
- Van Eck, N. and Waltman, L.,(2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *scientometrics*, 84(2), pp.523-538. DOI: <https://doi.org/10.1007/s11192-009-0146-3>.
- Van Raan, A. F. J. (2000). *The use of bibliometric analysis in research performance assessment and monitoring of interdisciplinary scientific developments*. *Technology Analysis & Strategic Management*, 12(2), 261-276.

Xie, L., Chen, Z., Wang, H., Zheng, C., & Jiang, J. (2020). Bibliometric and visualized analysis of scientific publications on atlantoaxial spine surgery based on Web of Science and VOSviewer. *World neurosurgery*, 137, 435-442.

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