SEMARAK ILMU PUBLISHING

Journal of Advanced Research in Applied Sciences and Engineering Technology

Journal homepage:
https://semarakilmu.com.my/journals/index.php/applied_sciences_eng_tech/index
ISSN: 2462-1943

Social Impact and Internationalization of "Indonesian Journal of Science and Technology" the Best Journal in Indonesia: A Bibliometric Analysis

Asep Bayu Dani Nandiyanto [1,*], Dwi Fitria Al Husaeni [1], Dwi Novia Al Husaeni [1]

[1] Fakultas Pendidikan Matematika dan Ilmu Pengetahuan Alam, Universitas Pendidikan Indonesia, Jl. Dr. Setiabudi No. 229, Bandung, Indonesia

ARTICLE INFO

Article history:
Received 14 June 2023
Received in revised form 20 August 2023
Accepted 25 August 2023
Available online 10 September 2023

Keywords:
Bibliometric; Indonesian Journal of Science and Technology; Research Community; Scientific Journals

ABSTRACT

This study provides bibliometric scopus data analysis from publications in the Indonesian Journal of Science and Technology (IJoST) from 2016 to 2023 using VOSViewer and RStudio. As IJOST is the best journal in Indonesia (Q1 in scimagojr with the best rank position) with an open-access feature, it will be fascinating to learn more about the societal impact and internationalization of this journal and understand how Indonesian researchers published their work and with whom they collaborate. To complete this bibliometric study, four steps were used: data collection, screening, visualization, and analysis. The involvement of authors from more than 40 countries and 5 continents, the existence of numerous excellent published papers that have been cited more than 40 times, and the excellent Scopus citesore of 11.2 support our hypothesis for the societal impact and internalization of IJoST, informing its significant alignment between publication and citations for the global community. An excellent correlation between the countries was identified, exposing the research collaboration traditions of Indonesian researchers with other countries. The research topics featured in the IJoST have correlations with the authors' research fields, in particular mostly those in Chemistry and Chemical Engineering, General Engineering, Computer Science, and Earth and Planetary Sciences. Comprehensive information about the most productive scholars publishing in IJOST was also exposed to support the social impact analysis, indicating this journal as one of the incubators for disseminating research. This study brings ideas and information for practitioners, government, and stakeholders relating to research and publication collaboration.

1. Introduction

For many years now, scientific journals have emerged as a key channel for publishing research findings. The primary scientific communities can develop communication through the use of scientific periodicals. Scientific journals are an important meaning for developing science and technology [1, 2]. Scientific journals do not only provide information but also allow researchers to publish their research results. Thus, research results can be accessed and used by the public at large scale.

* *Corresponding author.*
E-mail address: nandiyanto@upi.edu

https://doi.org/10.37934/araset.32.2.4259

With the advent of the digital age, more and more research journals have been established across the country. Indonesia itself has 8,881 journals and 1395 publishers recorded in the Indonesian Science and Technology Index (SINTA) (see https://sinta.kemdikbud.go.id/journals). One of the best-indexed and reputable journals in Indonesia is the Indonesian Journal of Science and Technology (IJoST) (see https://ejournal.upi.edu/index.php/ijost; e-ISSN 2527-8045 and p-ISSN 2528-1410). Based on the Indonesian accreditation SINTA, IJOST is categorized in the top rank with S1 indexed journal, having a journal impact of 10.69; 4,462 citations per 5 years; 29 H5-index; and 4,545 citations.

IJoST is an open-access and peer-reviewed journal, published by the Universitas Pendidikan Indonesia (UPI), the best university in Education in Indonesia. IJoST is a Scopus-indexed journal with a Q1 rank with a citesore of 11.4. Scimagojr has listed IJoST as the best journal in Indonesia (see https://www.scimagojr.com/journalrank.php?country=ID; accessed on 5 August 2023) with an SJR of 1.176 (see Figure 1). In 2016-2020, IJoST was published in April and September. Since 2020, IJoST has been published 3 times annually (April, September, and December). IJoST publishes only articles with high quality, shown by its relatively high citation per article (see Table 1).

In this study, we analyzed bibliometric data using bibliometric analysis of publications in IJoST between 2016 and 2023 to verify whether this journal has been successful in its quest for internationalization and its impact. This will be reliable evidence to know whether the open-access publishing model adopted by some Indonesian journals improves and reaches reputation efficiency. In this research, our internationalization assessment is limited to studying IJoST.

Research using bibliographic analysis has been carried out by several researchers as shown in Tables 2 and 3. Table 2 is previous studies regarding bibliometric analysis, whereas Table 3 is our work. In general, the use of bibliometric analysis to explore and visualize the current literature is very effective. Results from previous studies confirm the effectiveness of bibliometric analysis to explore and visualize the current literature which can be used to decide whether further research should be undertaken. However, based on the studies that have been carried out, no one has yet discussed the impact of Indonesian journals using bibliographic analysis.

Different from other bibliometric articles (as shown in Tables 2 and 3), our analysis is original since it uncovers IJoST from the bibliometric perspective and analyzes its impact on the social and international community. Indeed, understanding IJoST as the best journal in Indonesia will be fascinating. It will not only gain information about its societal impact and internationalization but also understand how Indonesian researchers published their work and with whom they collaborate.

To complete this bibliometric study, four steps were used: data collection, screening, visualization, and analysis. The engagement of authors from more than 40 countries and 5 continents, the existence of numerous published papers with citations of more than 40 times (see Table 1), and the excellent Scopus citesore and SJR value (see Figure 1) support our hypothesis for the societal impact and internationalization of IJoST. Analysis regarding the correlation between the countries involved was also done to expose the new research collaboration traditions. Also, this study was supported by comprehensive information about the most productive scholars publishing in IJoST to understand what kind of research is published in this journal. This study brings ideas and information for practitioners, government, and stakeholders relating to research and publication collaboration.

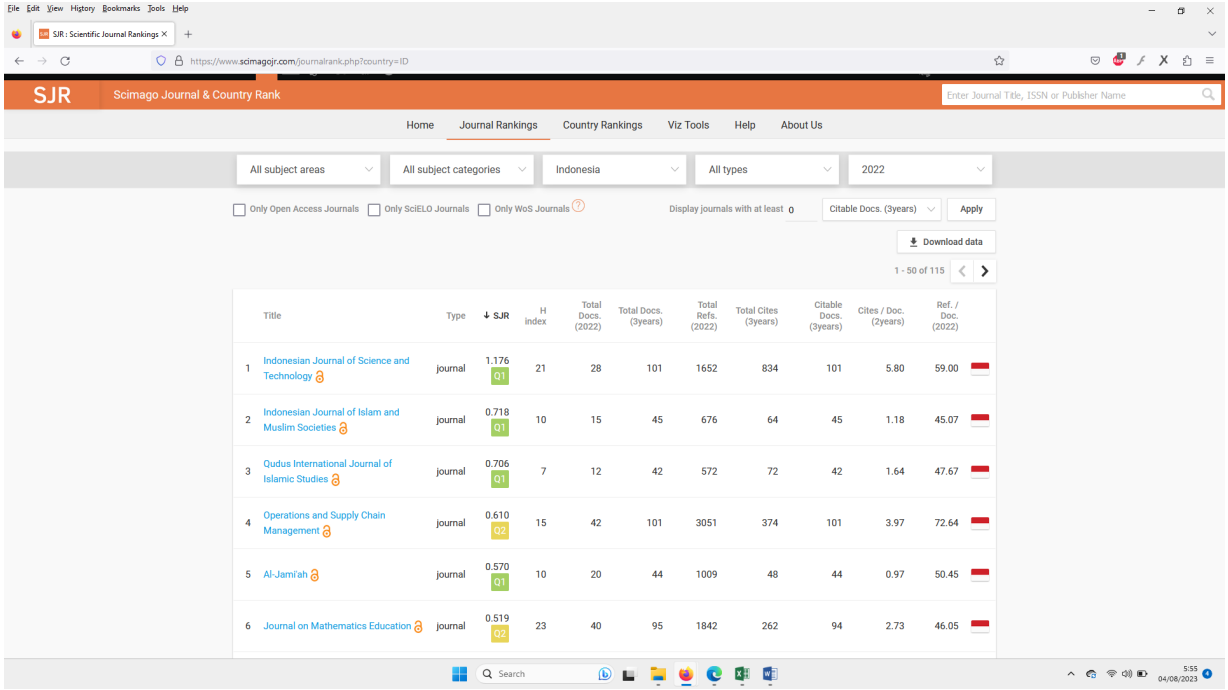

Fig. 1. Appearance IJOST in scimagojr

Table 1
Top cited articles in IJOST

No.	Document title	Authors	Year	Cited	Ref
1	How to read and interpret FTIR spectroscope of organic material	Nandiyanto et al.	2019	757	[3]
2	A bibliometric analysis of COVID-19 research using vosviewer	Hamidah et al.	2020	90	[4]
3	Review: Agricultural wastes as a source of silica material	Permatasari et al.	2016	73	[5]
4	Trends in expert system development: A practicum content analysis in vocational education for over grow pandemic learning problems	Ana	2020	60	[6]
5	Distance learning in vocational high schools during the covid-19 pandemic in West Java province, Indonesia	Mulyanti et al.	2020	59	[7]
6	Photodecomposition profile of organic material during the partial solar eclipse of 9 March 2016 and its correlation with organic material concentration and photocatalyst amount	Nandiyanto et al.	2016	57	[8]
7	How bibliographic dataset portrays decreasing number of scientific publication from Indonesia	Nandiyanto et al.	2020	53	[9]
8	The concise latest report on the advantages and disadvantages of pure biodiesel (B100) on engine performance: literature review and bibliometric analysis	Setiyo et al.	2021	49	[10]
9	Working volume and milling time on the product size/morphology, product yield, and electricity consumption in the ball-milling process of organic material	Nandiyanto et al.	2018	46	[11]
10	How to calculate adsorption isotherms of particles using two-parameter monolayer adsorption models and equations	Ragadhita & Nandiyanto	2021	44	[12]
11	An instructional design for online learning in vocational education according to a self-regulated learning framework for problem solving during the covid-19 crisis	Sangsawang	2020	42	[13]

Table 1 (Continue)
Top cited articles in IJOST

No.	Document title	Authors	Year	Cited	Ref
12	Students' intention to share information via social media: A case study of COVID-19 pandemic	Hashim et al.	2020	41	[14]
13	Removal of Methylene blue by adsorption onto activated carbon from coconut shell (Cocous Nucifera L.)	Khuluk et al.	2019	38	[15]
14	Kinetic and thermodynamics studies on the adsorption of phenol on activated carbon from rice husk activated by ZnCl2	Anshar et al.	2016	34	[16]
15	Application of plants extracts as green corrosion inhibitors for steel in concrete - A review	Asmara et al.	2018	32	17]
16	Level of use and satisfaction of e-commerce customers in covid-19 pandemic period: An information system success model (issm) approach	Dirgantari et al.	2020	29	[18]
17	A Bibliometric Analysis of Management Bioenergy Research Using Vosviewer Application	Soegoto et al.	2022	28	[19]
18	The Deployment of Drones in Sending Drugs and Patient Blood Samples COVID-19	Anggraeni et al.	2020	27	[20]
19	Meta-analysis of student performance assessment using fuzzy logic	Amelia et al.	2019	27	[21]
20	Membrane bioreactor for domestic wastewater treatment: Principles, challanges and future research directions	Bilad	2017	26	[22]
21	Comparison of air temperature under global climate change issue in Gifu City and Ogaki City, Japan	Rahmat & Mutolib	2016	26	[23]
22	Green skills understanding of agricultural vocational school teachers around west java indonesia	Handayani et al.	2020	24	[24]
23	Optimization and interpretation of heat distribution in sterilization room using convection pipe	Abdurrahman et al.	2019	24	[25]
24	A review on rotating biological contactors	Waqas & Bilad	2019	23	[26]
25	Failure investigation of plastic shredding machine's flange coupling based on mechanical analysis	Nurprasetio et al.	2017	23	[27]

Table 2
Previous studies of bibliometric analysis

No	Title	Topic Discussion	Ref
1	Internationalization of the Moroccan Journal of Chemistry: A bibliometric study	This research discusses the impact and verifies the success of the Moroccan Journal of Chemistry in internationalization.	[28]
2	A bibliometric analysis of covid-19 research using VOSviewer.	This study discusses the development of research during the Covid-19 era using bibliometric analysis.	[29]
3	The clatest report on the advantages and disadvantages of pure biodiesel (B100) on engine performance: Literature review and bibliometric analysis	This research discusses the literature review of the advantages and disadvantages of pure biodiesel on engine performance.	[30]
4	A bibliometric analysis of management bioenergy research using vosviewer application	This study discusses the trends and developments of research in the field of bioenergy management.	[31]
5	Oil palm empty fruit bunch waste pretreatment with benzotriazolium-based ionic liquids for cellulose conversion to glucose: Experiments with computational bibliometric analysis	This research was conducted to analyze the utilization of benzotriazole ionic salt liquid as a solvent for empty palm oil fruit bunches using bibliometric analysis and VOSviwer.	[32]

Table 2 (Continue)
Previous studies of bibliometric analysis

No	Title	Topic Discussion	Ref
6	Biomass-based supercapacitors electrodes for electrical energy storage systems activated using chemical activation method: A literature review and bibliometric analysis.	This research discusses the potential of biomass-based carbon as the electrode of a highly efficient supercapacitor that can facilitate highly efficient current transport in energy storage systems.	[33]
7	Dental suction aerosol: Bibliometric analysis.	This study discusses the development of dental aerosol suction research through the distribution of bibliometrics maps and research trends using VOSViewer.	[34]
8	Bibliometric analysis of nano metal-organic frameworks synthesis research in medical science using VOSviewer	This study discusses the bibliometric analysis of nFs for medical science by combining mapping analysis using VOSviewer software.	[35]
9	Past, current and future trends of salicylic acid and its derivatives: A bibliometric review of papers from the Scopus database published from 2000 to 2021.	This research discusses scientometric studies in the organizational progress and prospects of SA and its derivatives.	[36]
10	Correlation between process engineering and special needs from bibliometric analysis perspectives.	This study discusses the integration of mapping analysis using the VOSviewer program.	[37]
11	Bibliometric analysis for understanding the correlation between chemistry and special needs education using VOSviewer indexed by Google.	In this study, it is discussed about combining mapping analysis with the use of VOSviewer.	[38]
12	Computing bibliometric analysis with mapping visualization using VOSviewer on “pharmacy” and “special needs” research data in 2017-2021.	This research discusses mapping visualization in research that has pharmaceutical topics and special needs in five years (2017-2021).	[39]
13	Nutritional research mapping for endurance sports: A bibliometric analysis.	This study discusses research mapping in the field of nutrition for endurance sports.	[40]
14	Bibliometric and visualized analysis of scientific publications on geotechnics fields.	This study analyzed the development of research related to Geotechnical Engineering through bibliometric distribution maps using the VOSviewer application.	[41]
15	A bibliometric analysis of computational mapping on publishing teaching science engineering using VOSviewer application and correlation.	This study discusses the description of research developments in the fields of science education and engineering.	[42]
16	What is the correlation between chemical engineering and special needs education from the perspective of bibliometric analysis using VOSviewer indexed by google scholar?	This study analyzes "Special Needs of Chemical Engineering" by combining mapping analysis and the VOSviewer application.	[43]
17	Counseling guidance in science education: Definition, literature review, and bibliometric analysis.	This research discusses the topic of guidance and counseling in science education using a literature review and bibliometric analysis.	[44]
19	Phytochemical profile and biological activities of ethylacetate extract of peanut (Arachis hypogaea L.) stems: In-vitro and in-silico studies with bibliometric analysis.	This study analyzed the chemical content and pharmacological activity of A.hypogaea stems in-vitro and in-silico.	[45]

Table 3
Our works in bibliometric analysis

No	Title	Topic Discussion	Ref
1.	A bibliometric analysis of materials research in Indonesian journal using VOSviewer	The research trends in the realm of materials are discussed in this paper.	[46]
2.	Research trend on the use of mercury in gold mining: Literature review and bibliometric analysis	In this study, the use of mercury in gold mining is discussed.	[47]
3.	Bibliometric analysis of educational research in 2017 to 2021 using VOSviewer: Google scholar indexed research.	In this work, bibliometric evaluation of Google Scholar-indexed papers is discussed in the context of education.	[48]
4.	Bibliometric analysis of special needs education keyword using VOSviewer indexed by google scholar	In this work, special education-related bibliometric analysis of Google Scholar-indexed papers is included.	[49]
5.	Sustainable development goals (SDGs) in science education: Definition, literature review, and bibliometric analysis.	This study examines the causes for and patterns in the development of research on sustainable development goals.	[50]
6.	A bibliometric analysis of chemical engineering research using VOSviewer and its correlation with covid-19 pandemic condition.	This study examines the causes for and patterns in the development of research on sustainable development goals.	[51]
7.	Computational bibliometric analysis of research on science and Islam with VOSviewer: Scopus database in 2012 to 2022.	This study uses information from Scopus-indexed article data to explore the evolution of research with bibliometric analysis in the disciplines of science and Islam.	[52]
8.	Resin matrix composition on the performance of brake pads made from durian seeds: From computational bibliometric literature analysis to experiment.	This study uses bibliometric analysis to discuss the impact of resin matrix composition on brake pad performance.	[53]
9.	Bibliometric Analysis of Briquette Research Trends During the Covid-19 Pandemic.	This paper examines briquette research trends during the Covid-19 epidemic.	[54]
10	Computational Bibliometric Analysis on Publication of Techno-Economic Education.	This study uses bibliometric analysis to discuss the evolution of publications in techno-economic education.	[55]
11	How bibliographic dataset portrays decreasing number of scientific publications from Indonesia	This research investigates how to describe the decline in the number of scientific publications in Indonesia using bibliographic datasets.	[56]
12	Research trends from the scopus database using keyword water hyacinth and ecosystem: A bibliometric literature review	This study examines research trends related to water hyacinth and ecosystems in the Scopus database.	[57]
13	Bibliometric analysis of high school keyword using VOSviewer indexed by google scholar	This study analyzes research related to senior high school using bibliometric analysis.	[58]
14	How to calculate bibliometric using VOSviewer with Publish or Perish (using Scopus data): Science education keywords	This study examines how to analyze bibliometrics using VOSviewer with the Publish or Perish application.	[59]
15	Bibliometric analysis for understanding “science education” for “student with special needs” using VOSviewer	This research examines related to bibliometric analysis in the field of science education and students with special needs.	[60]
16	Bibliometric analysis of research development in sports science with vosviewer.	This study examines the development of research in sports science.	[61]
17	Bibliometric analysis of engineering research using Vosviewer indexed by google scholar	This study examines the development of research on technical topics using VOSviewer with data taken from article data indexed by Google Scholar.	[62]
18	Bibliometric computational mapping analysis of publications on mechanical engineering education using VOSviewer	This research examines related to the development of research in the field of engineering education.	[63]

2. Methodology

This research used the bibliometric analysis method based on the Scopus database from 2016 to 2023 using VOSviewer and RStudio. VOSviewer was used as a tool to visualize publication data. Meanwhile, RStudio was used to retrieve analysis data on the development of article publishing in IJoST. The keywords used were Source title: "Indonesian Journal of Science and Technology". Data was taken via the https://www.scopus.com/ page on August 31, 2023. Statistical analysis was used to support quantitative analysis and visualization of the literature based on the principles of bibliometric analysis. Detailed information regarding the use of bibliometric analysis using VOSviewer is presented in our previous report [64].

Bibliometric mapping used text-mining analysis techniques. Text-mining analysis is an analysis of the appearance of words/terms that are visualized in a word presence map. The VOSviewer bibliometric analysis used in this research is co-authorship, citation, and bibliographic coupling. This study consisted of four steps: (1) data harvesting, (2) data screening, (3) data visualization, and (4) data analysis. Figure 2 shows a further explanation of the research stages.

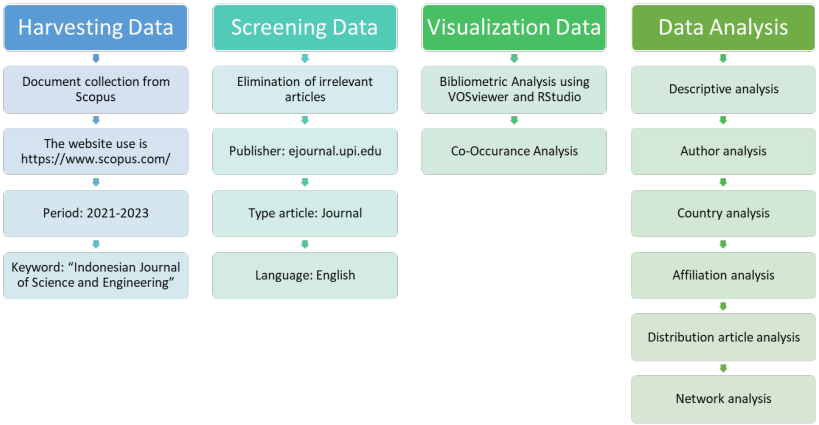

Fig. 2. Research procedure

2.1 Harvesting Data

At this stage, we collected data for trend analysis and analyzed the impact of IJoST journals on research publications based on the Scopus page. The article data retrieved were those published from 2016 (when IJoST was established) to 2023.

2.2 Screening Data

Research documents collected during stage 1 cannot be analyzed directly. Data filtering is required. At this stage, data screening was carried out by paying attention to the year of publication and publisher. The results of screening data obtained 203 relevant articles. Finally, the collected research document data was stored in three formats namely *.csv format, *.ris format, and *.BibText format.

2.3 Visualization Data

The data that has been saved in the format (*.ris) was uploaded to the VOSviewer application to get the data mapping results. The terms in the VOSviewer network mapping visualization were filtered at this stage.

2.4 Analysis Data

At this stage, the data that has been visualized and exported to R Studio and Ms. Excel was analyzed in such a way that the results of research developments are obtained per year, the author with the most research publications, the country, and the author/country relationship.

3. Results and Discussion

3.1 Subject Area in IJoST

Figure 3 shows the distribution of research documents published in IJoST by field of study. Based on the Scopus database, the distribution of research at IJoST is mostly evenly divided into 4 fields of study namely Chemical Engineering, Engineering, Computer Science, and Earth and Planetary Sciences. These results prove that IJoST has contributed to a scientific field that is currently growing rapidly. This figure also shows an overview of the co-occurrence network of keyword research papers. The larger node correlates with the higher intensity of the subject published in IJoST [64]. Based on VOSviewer mapping visualization analysis, some terms with the highest number of occurrences are "study" (38 events), process (20 events), technology (18 events), system (18 events), application (17 events), and review (12 events).

Articles related to science and technology are most widely accepted for publication in IJoST, confirming IJoST in maintaining the quality of its publications by adjusting its focus and scope. This also assists and helps researchers when submitting their research results to focus their attention on the topic being worked on and to concentrate on their findings, collecting, and analyzing data according to the research topic raised. Researchers also can get benefits by raising the scope of the study and focus of discussion [65].

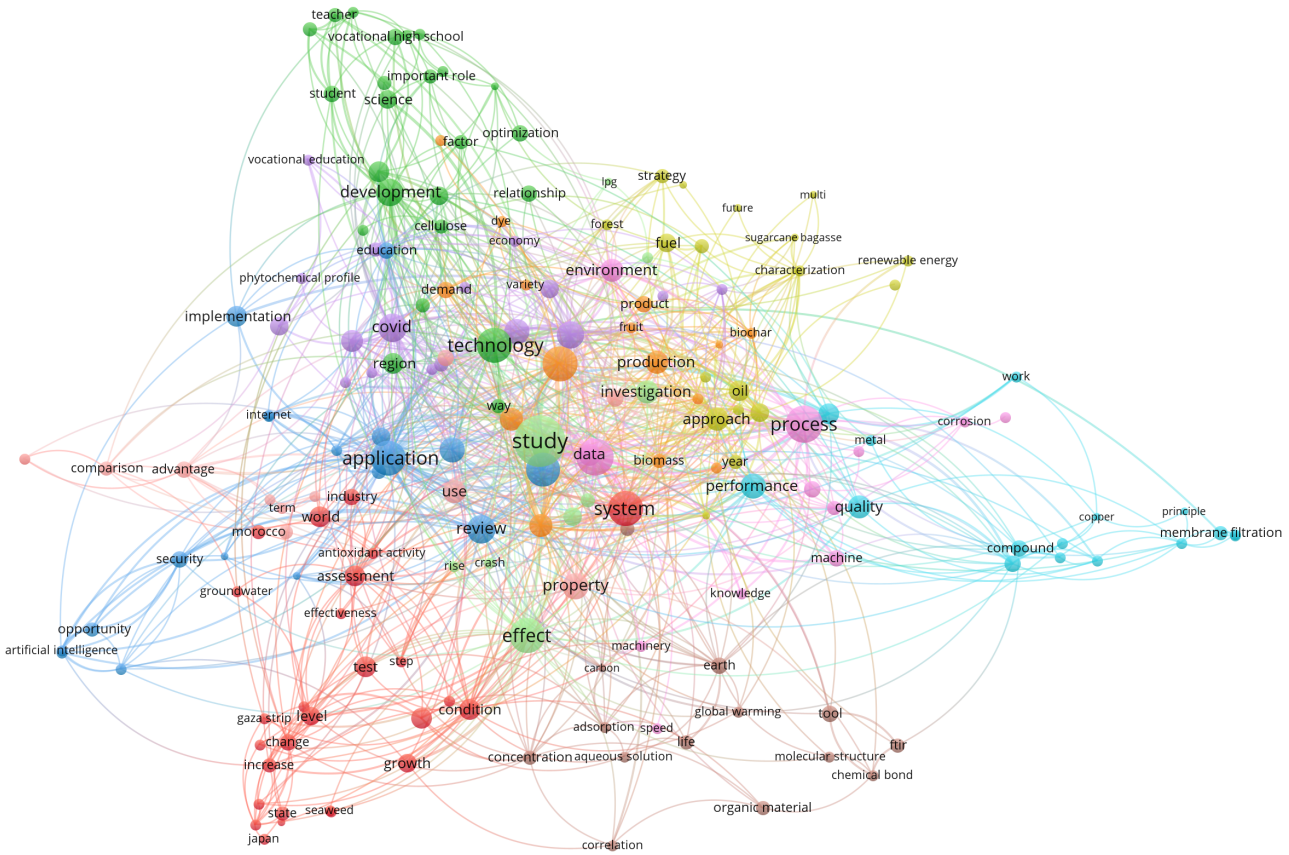

Fig. 3. Co-occurrence Network of the Keywords of research papers published in IJoST between 2016 to 2021

3.2 Distribution of Publication Number, Author, Affiliation, and Countries

Figure 4 presents a correlation of the number of authors, affiliations, articles published, and countries involved in each issue, corresponding to "orange circle", "grey square", "blue triangle", and "yellow diamond" dots, respectively.

The distribution of the number of publications from IJoST in the last 8 years with 203 Scopus-indexed articles is relatively constant since it should maintain the quality of the articles (see Figure 4 in "gray square" dots). The average number of published articles in IJoST is 25 articles annually. At the beginning of its establishment, IJoST 2016 managed to publish 20 articles. It is relatively constant in publishing 18 articles until 2018. In 2019, number of articles published reached 26 articles annually. Since it raises enough numbers in one issue, the journal increases its issues in 2020 from twice to three times annually (i.e. April, September, and December). It is also supported by the covid condition, in which there is a boosting number of submissions to IJoST, resulting in the number of publications in IJoST of 39 articles annually. Since 2021, it is published fairly consistently with 25-30 articles annually. IJoST maintains the number of publications to ensure the quality of the articles.

The distribution of authors is shown in Figure 4 in "orange circle" dots. Authors' numbers fluctuated, depending on the type of papers. The average number of authors involved in one issue is about 50 authors. The number of authors is relatively in line with the number of papers published.

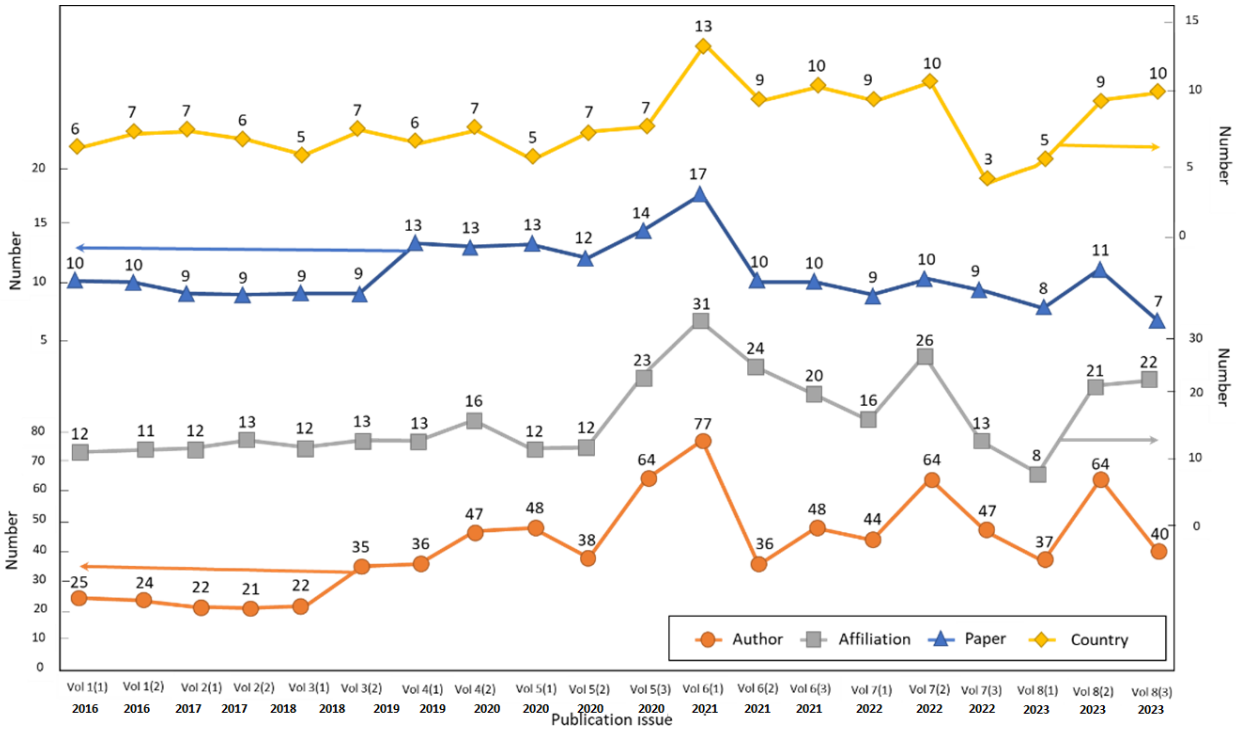

Fig. 4. Distribution of countries and affiliations for each issue of articles published in IJoST

Regarding the distribution of countries (see Figure 4 in "yellow rhombus" dots), IJoST engages authors from more than 41 countries around the world, including Algeria, Australia, Bangladesh, Belgium, Brunei Darussalam, Canada, Colombia, Egypt, France, Germany, Hungary, India, India, Iran, Iraq, Italy, Japan, Jordan, Malaysia, Mauritania, Morocco, Netherlands, Nigeria, Pakistan, Palestine, Mexico, Philippines, Russian Federation, Saudi Arabia, Singapore, South Africa, South Korea, Spain, Taiwan, Thailand, Turkey, Uganda, United Arab Emirates, United Kingdom, the United States, and Vietnam. The detailed number of countries involved is presented in Figure 5. 15 countries contributed

the most articles to be published in IJoST, namely Indonesia with 125 articles. Malaysia 43 articles, Japan 29 articles, Morocco 10 articles, United States 8 articles, Thailand 6 articles, Iraq 5 articles, Pakistan 5 articles, Algeria 4 articles, Netherlands 4 articles, South Korea 4 articles, Brunei Darussalam 3 articles, Colombia 3 articles, India 3 articles, and Palestine 3 articles. Since IJoST is published in Indonesia, the most published country is Indonesia with 125 published articles. This confirms previous findings regarding the publication bias of the country of origin [66].

IJoST also involves 162 institutions that actively contributed to publishing their articles based on the Scopus database. Figure 4 in "blue triangle" dots shows the distribution of affiliates who publish articles in IJoST. In the beginning years (from 2016-2019), IJoST involves about 13 affiliations per issue. It increases from 2020 with the number of affiliations of 20 affiliations per issue. Detailed institutions involved per issue are shown in Table S1 in the supporting information. Figure 6 shows top 15 affiliates engaged in publication in IJoST, namely the Universitas Pendidikan Indonesia (UPI) with 51 articles, Universiti Teknologi PETRONAS with 17 articles, Taylor's University Malaysia with 11 articles, Bandung Institute of Technology with 9 articles, Universite Mohammed Premier Oujda with 7 articles, University of Lampung 7 articles, Universiti Malaysia Pahang 7 articles, National Research and Innovation Agency 6 articles, Gifu University 5 articles, Hiroshima University 5 articles, Tokyo Institute of Technology 5 articles, Tokyo Institute of Technology 5 articles, Gadjah University Mada with 5 articles, IPB University with 5 articles, Indonesian Institute of Sciences with 5 articles, and Yogyakarta State University with 5 articles. These results indicate that the longer age of the journal correlates with the increasing diversity of contribution countries and affiliations. Indeed, this is in line with the more and broader readers reading articles from IJoST.

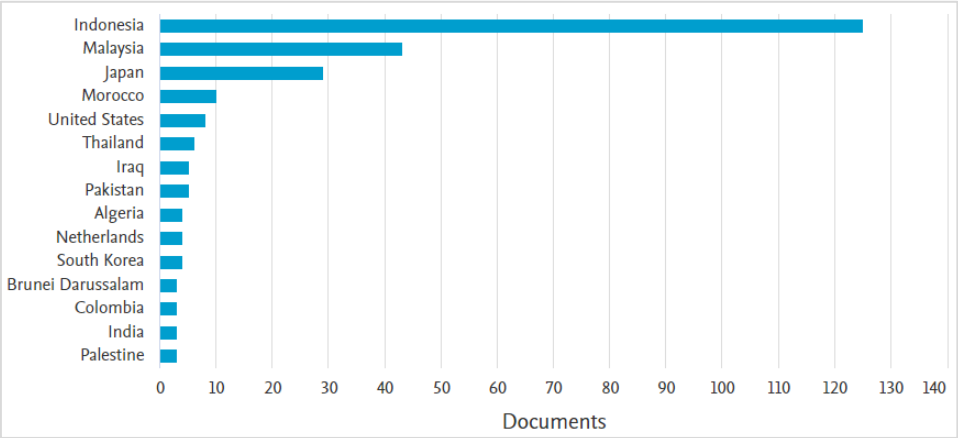

Fig. 5. Distribution of countries involved in the published articles in IJoST

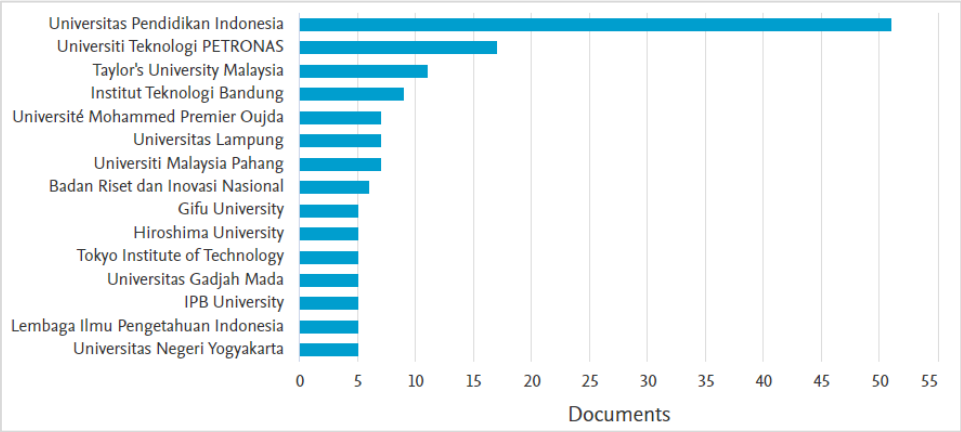

Fig. 6. Affiliates contributed to the published articles in IJoST

3.3 Network Visualization of Country and Affiliate Distribution in IJoST

Figure 7 shows the network visualization, showing the linkage and strength of the relationship through the value of the term link strength [67]. The greater link strength value correlates with the stronger relationship between terms [68]. 34 countries are connected, namely Algeria, Iran, Netherlands, Pakistan, United States, Canada, France, Japan, Vietnam, Germany, Morroco, Palestine, United Arab Emirates, Bangladesh, Indonesia, Mexico, Brunei Darussalam, Iraq, Mexico, Brunei Darussalam, Iraq, Malaysia, India, Nigeria, South Africa, India, Nigeria, South Africa, Italy, South Korea, Taiwan, Belgium, Singapore, Colombia, Spain, Australia, Saudi Arabia, Uganda, United Kingdom, and Thailand. These results indicate that the authors from one country already have collaboration in carrying out research, and this collaboration brings to the publication of their work in IJoST. The excellent correlation between the countries exposes the research collaboration traditions of Indonesian researchers with other countries. This also uncovers our hypothesis that IJoST supports and gives a social impact. IJoST becomes one of the incubators for disseminating research collaboration. Indeed, this result brings ideas and information for practitioners, government, and stakeholders relating to research and publication collaboration.

In addition, several affiliates have collaborated in developing national research that has been published in IJoST, namely the UPI, National Research and Innovation, Hasanuddin University, Thammasat University, Halu Oleo University, Khairun University, and Bina Husada Kendari Polytechnic. Cooperation between research institutions and countries was found, informing that carrying out research and development is very urgent and important considering the need for the vast territory and the variety of problems and natural resources [69].

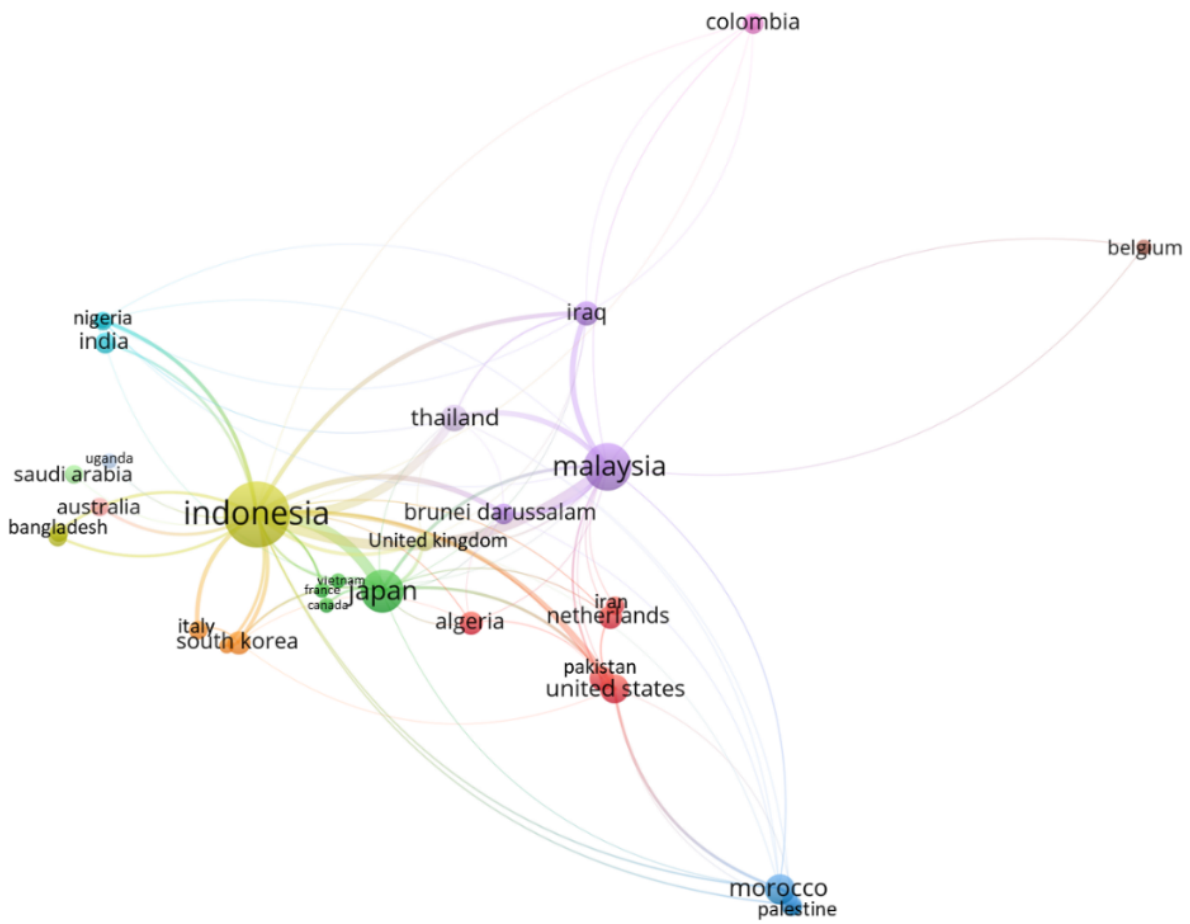

Fig. 7. Network visualization of countries that publish articles in IJoST

3.4 Authors with the Highest Number of Citations in IJoST

Table 1 shows the top 25 articles with the highest number of citations that have been published in IJoST. The first article that was most cited was the article written by Nandiyanto et al. [3] entitled "How to Read and Interpret FTIR Spectroscope of Organic Materials". This article focuses on the subject area of Chemical and Organic Materials with 766 citations in Scopus. The second most cited article in the IJoST journal is an article on Bibliometric analysis of Covid-19 written by Hamidah et al. [4] with 90 citations. Authors have published their research on topics featured in the IJoST, relating to Chemistry and Chemical Engineering, General Engineering, Computer Science, and Earth and Planetary Sciences, which is in line with IJoST's aims and scopes. Comprehensive information about the most productive scholars publishing in IJOST was also exposed to support the social impact analysis, indicating this journal as one of the incubators for disseminating research. Indeed, this also informs that IJoST becomes one of the references used in the community, giving better impact for increasing science and technology development.

3.5 Distribution of Authors in IJoST

The detailed distributed number of authors is presented in Figure 4 in “orange circle” dots. When analyzing the data for authors engaged in IJoST, the top 15 authors were exposed. Nandiyanto has the highest number of articles published in IJoST (13 articles), followed by Bilad (12 articles), Putra (9 articles), Hammaouti (8 articles), Abdullah (7 articles), Rahmat (7 articles), Al-Obaidi (6 articles), Aziz (5 articles), and Riza (5 articles). In addition, Budiman, Humaidi, Kurniawan, Ragadhita, and Setiyo published 4 articles in IJoST. The six most productive scientists at IJoST namely Nandiyanto, Abdullah, Riza, Setiyo, Budiman, and Ragadhita are members of researchers who work in local scientific institutions. These results indicate that there is an important tendency for collaboration between Indonesian scientists in IJoST. IJoST is used as a forum for local scientists to develop and discuss their research results by providing preliminary findings and future research directions. In addition, the author with the biggest contribution in writing articles at IJoST (Nandiyanto) is the 2% most influential scientist in the world. The other nine most productive scientists at IJoST are members of researchers that work in international scientific institutions. This shows that IJoST has helped encourage the involvement of several local and international scientists and collaborators in research in Indonesia. Therefore, IJoST can serve as a tool to mature research careers through interactions between local and international scientists [28].

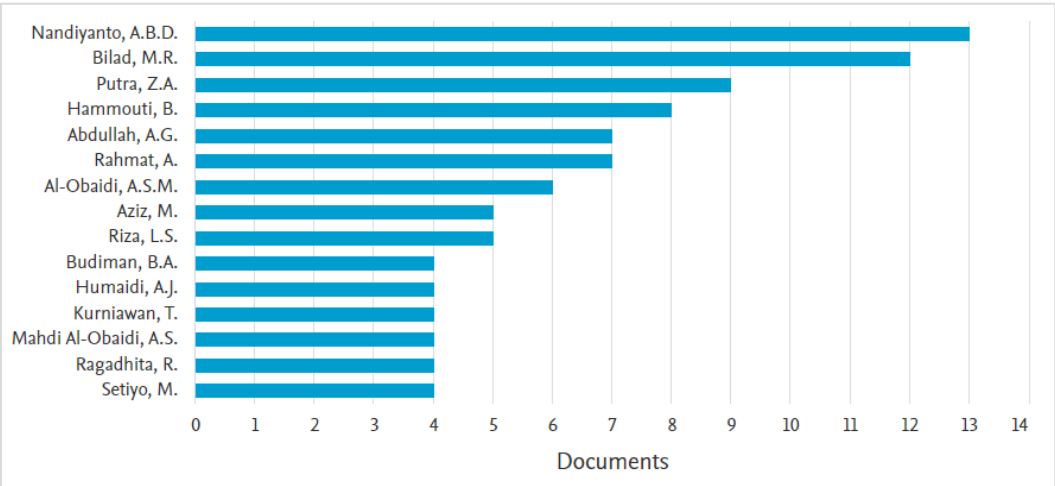

Fig. 8. Distribution of article authors published in IJoST

Researchers published in IJoST have carried out collaborations, as shown in Figure 9. A connection between one author and another or network visualization was identified with 10 connectivity clusters [55]. The clusters are:

(i) Cluster 1: Asasutjarit, Fajriah, Fristiohady, Kamaluddin, Malaka, Manggau, Maryanti, Masrik, Meylani, Muktiarni, Nohong, Rahmatika, Sahidin, Sundowo, and Yodha.
(ii) Cluster 2: Aryanto, Firdharini, Priyono, Putra, Rahayu, Sugianto, and Widayatno.
(iii) Cluster 3: Al Husaeni, Al-Obaidi, Hasan, Humaidi, Husain, and Kadhim.
(iv) Cluster 4: Hariadi, Hidayat, Kurniawan, Mutolib, Rahmat, and Triwisesa.
(v) Cluster 5: Anggoro, Febriansyar, Istadi, Jongsomjit, and Royanto.
(vi) Cluster 6: Alaros, Asirvatham, Marjani, and Shafiq.
(vii) Cluster 7: Bilad, Harun, Rahim, and Saeed.
(viii) Cluster 8: Dania, Hendrawan, Santoso, and Utama.
(ix) Cluster 9: Ana, Komaro, and Suherman.
(x) Cluster 10: Aziz, Nandiyanto, and Ragadhita.

Figure 10 shows the detailed network visualization of article authors at IJoST which has the largest number of citations. Nandiyanto has the highest number of citations in IJoST, namely 76 times. Then, Al Husaeni, D. F. has cited 39 times, Ragadhita has cited 30 times, and Al Husaeni, D. N. has 19 citations. Nandiyanto, Al Husaeni D. F., Al Husaeni D. N., and Ragadhita are authors who are connected in writing articles published in IJoST. Apart from them, 28 other authors who are interconnected and collaborate in conducting research, including Al-Obaidi, Biddinika, Fiandini, Humaidi, Man, Maryanti, Triawan, Wang, Anggoro, Buchori, Chen, Istadi, Liu, Oktiani, Riyanto, Utama, Wang, Zhang, Zhang, Diantini, Fristiohadya, Sahidin, Wahyuni, and Yodha.

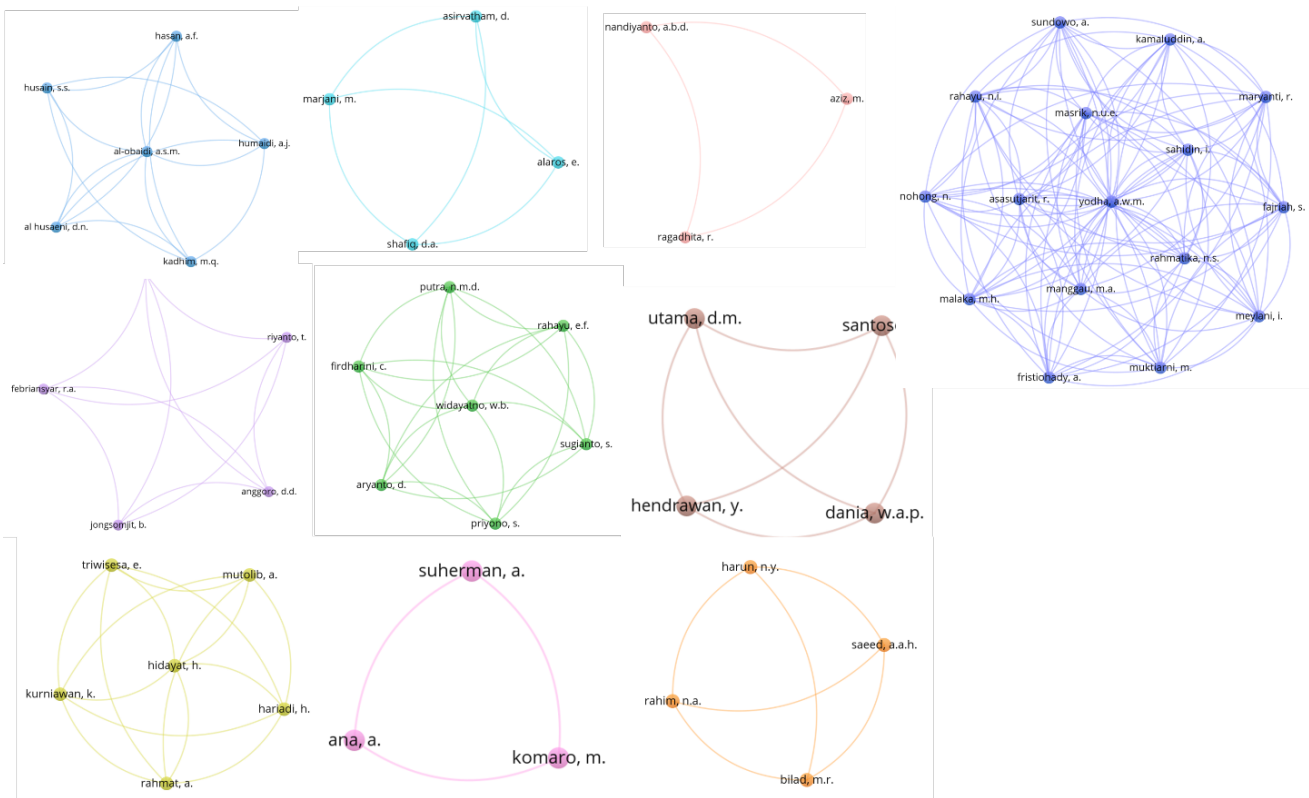

Fig. 9. Connections between authors who publish articles in IJoST

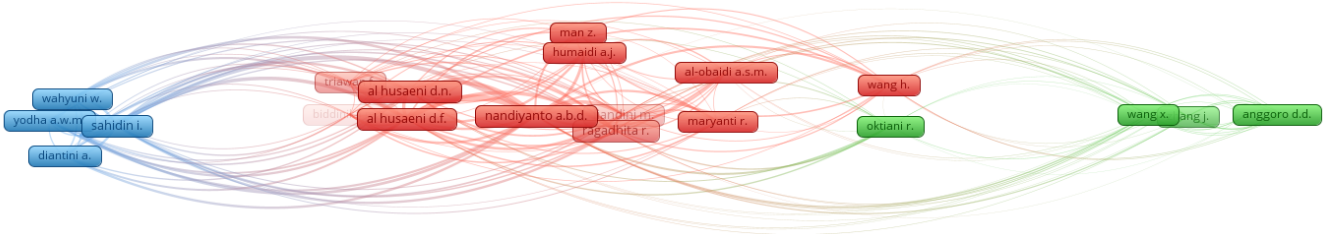

Fig. 10. Network visualization of article authors in IJoST based on the number of citations

4. Conclusions

We have successfully analyzed the publication of bibliographic data in IJoST between 2016 and 2023 to verify whether this journal has been successful in its quest for internationalization and societal impact. IJoST has succeeded in raising topics in Chemical Engineering, Engineering, Computer Science, to Earth and Planetary Sciences. IJoST has encouraged local and international research networks by making collaborations and allowing this journal as a forum for discussing and enhancing research implementation initiatives. Regardless of its significance in the global community, as shown by the highest number of citations, we found that IJoST is still dominated by the contribution of local scientists, namely Indonesia. Indeed, this is in line with the origin of IJoST as the Indonesian journal. IJoST already has engaged several contributions from international scientists such as from Malaysia, Japan, Morocco, the United States, Thailand, and Iraq. The finding of collaboration between Indonesian and international researchers can guarantee greater visibility and impact for researchers.

References

[1] de Miranda Santo, M., Coelho, M. G., dos Santos, D. M., and Fellows Filho, L. "Text mining as a valuable tool in foresight exercises: A study on nanotechnology." *Technological Forecasting and Social Change 73,* no. 8 (2006):1013-1027. https://doi.org/10.1016/j.techfore.2006.05.020.

[2] Knight, K. L. and Steinbach, T. A. "Selecting an appropriate publication outlet: A comprehensive model of journal selection criteria for researchers in a broad range of academic disciplines." *International Journal of Doctoral Studies 3*, (2008):59-79.

[3] Nandiyanto, A. B. D., Oktiani, R., and Ragadhita, R. "How to read and interpret FTIR spectroscope of organic material." *Indonesian Journal of Science and Technology 4*, no. 1 (2019):97-118. https://doi.org/10.17509/ijost.v4i1.15806.

[4] Hamidah, I. Sriyono, S., and Hudha, M. N. "A bibliometric analysis of covid-19 research using VOSviewer." *Indonesian Journal of Science and Technology 5*, (2020):34-41.

[5] Permatasari, N. Sucahya, T. N. and Nandiyanto, A. B. D. "Agricultural wastes as a source of silica material." *Indonesian Journal of Science and Technology 1*, no. 1 (2016):82-106.

[6] Ana, A. "Trends in expert system development: A practicum content analysis in vocational education for over grow pandemic learning problems." *Indonesian Journal of Science and Technology 5*, no. 2 (2020):246-260. https://doi.org/10.17509/ijost.v5i2.24616.

[7] Mulyanti, B., Purnama, W., and Pawinanto, R. E. "Distance learning in vocational high schools during the covid-19 pandemic in West Java province, Indonesia." *Indonesian Journal of Science and Technology 5*, no. 2 (2020):271-282. https://doi.org/10.17509/ijost.v5i2.24640.

[8] Nandiyanto, A. B. D., Sofiani, D., Permatasari, N., Sucahya, T. N., Wiryani, A. S., Purnamasari, A. and Prima, E. C. "Photodecomposition profile of organic material during the partial solar eclipse of 9 march 2016 and its correlation with organic material concentration and photocatalyst amount." *Indonesian Journal of Science and Technology 1*, no. 2 (2016):132-155. https://doi.org/10.17509/ijost.v1i2.3728.

[9] Nandiyanto, A. B. D., Biddinika, M. K. and Triawan, F. "How bibliographic dataset portrays decreasing number of scientific publication from Indonesia." *Indonesian Journal of Science and Technology 5*, no. 1 (2020a):154-175. https://doi.org/10.17509/ijost.v5i1.22265.

[10] Setiyo, M., Yuvenda, D., and Samuel, O. D. "The Concise latest report on the advantages and disadvantages of pure biodiesel (B100) on engine performance: Literature review and bibliometric analysis." *Indonesian Journal of Science and Technology 6*, no. 3 (2021):469-490. https://doi.org/10.17509/ijost.v6i3.38430.

[11] Nandiyanto, A. B. D., Andika, R., Aziz, M., and Riza, L. S. "Working volume and milling time on the product size/morphology, product yield, and electricity consumption in the ball-milling process of organic material." *Indonesian Journal of Science and Technology 3*, no. 2 (2018):82-94 https://doi.org/10.17509/ijost.v3i2.12752.

[12] Ragadhita, R. and Nandiyanto, A. B. D. "How to calculate adsorption isotherms of particles using two-parameter monolayer adsorption models and equations." *Indonesian Journal of Science and Technology 6*, no. 1 (2021):205-234. https://doi.org/10.17509/ijost.v6i1.32354.

[13] Sangsawang, T. "An instructional design for online learning in vocational education according to a self-regulated learning framework for problem solving during the COVID-19 crisis." *Indonesian Journal of Science and Technology 5*, no. 2 (2020):283-298. https://doi.org/10.17509/ijost.v5i2.24702.

[14] Hashim, S., Masek, A., Abdullah, N. S., Paimin, A. N., and Muda, W. H. N. W. "Students' intention to share information via social media: A case study of COVID-19 pandemic." *Indonesian Journal of Science and Technology 5,* (2020):236-245.

[15] Khuluk, R. H., and Rahmat, A. "Removal of methylene blue by adsorption onto activated carbon from coconut shell (Cocous Nucifera L.)." *Indonesian Journal of Science & Technology 4*, no. 2 (2019):229-240. https://doi.org/10.17509/ijost.v4i2.18179.

[16] Anshar, A. M., Taba, P., and Raya, I. "Kinetic and thermodynamics studies the adsorption of phenol on activated carbon from rice husk activated by ZnCl2." *Indonesian Journal of Science and Technology 1*, no. 1 (2016):47-60. https://doi.org/10.17509/ijost.v1i1.2213.

[17] Panca Asmara, Y., Kurniawan, T., Edy Sutjipto, A. G., and Jafar, J. "Application of plants extracts as green corrosion inhibitors for steel in concrete-A review." *Indonesian Journal of Science & Technology 3*, no. 2 (2018):158-170. https://doi.org/10.17509/ijost.v3i2.12760.

[18] Dirgantari, P. D., Hidayat, Y. M., Mahphoth, M. H., and Nugraheni, R. "Level of use and satisfaction of e-commerce customers in covid-19 pandemic period: An information system success model (ISSM) approach." *Indonesian Journal of Science and Technology 5*, no. 2 (2020):261-270. https://doi.org/10.17509/ijost.v5i2.24617.

[19] H. Soegoto, E. Soeryanto Soegoto, S. Luckyardi, A. Abhi Rafdhi. A bibliometric analysis of management bioenergy research using vosviewer application, Indonesian Journal of Science and Technology 7 (1) (2022) 89-104, https://doi.org/10.17509/ijost.v7i1.43328

[20] Anggraeni, S., Maulidina, A., Dewi, M. W., Rahmadianti, S., Rizky, Y. P. C., Arinalhaq, Z. F., and Al-Obaidi, A. S. M. "The deployment of drones in sending drugs and patient blood samples COVID-19." *Indonesian Journal of Science and Technology 5*, no. 2 (2020):193-200. https://doi.org/10.17509/ijost.v5i2.24462.

[21] Amelia, N., Abdullah, A. G., and Mulyadi, Y. "Meta-analysis of student performance assessment using fuzzy logic." *Indonesian Journal of Science and Technology 4*, no. 1 (2019):74-88. https://doi.org/10.17509/ijost.v4i1.15804.

[22] Bilad, M. R. "Membrane bioreactor for domestic wastewater treatment: Principles, challanges and future research directions." *Indonesian Journal of Science and Technology 2*, no. 1 (2017):97-123. https://doi.org/10.17509/ijost.v2i1.5993.

[23] Rahmat, A. and Mutolib, A. "Comparison air temperature under global climate change issue in Gifu city and Ogaki city, Japan." *Indonesian Journal of Science and Technology 1*, no. 1 (2016):37-46. https://doi.org/10.17509/ijost.v1i1.2212.

[24] Handayani, M. N., Ali, M., Wahyudin, D., and Mukhidin, M. "Green skills understanding of agricultural vocational school teachers around West Java Indonesia." *Indonesian Journal of Science and Technology 5*, no. 1 (2020):21-30. https://doi.org/10.17509/ijost.v5i1.22897.

[25] Abdurrahman, A., Umam, R., Irzaman, I., Palupi, E. K., Syazali, M., Junaidi, R., and Adi, L. C. "Optimization and interpretation of heat distribution in sterilization room using convection pipe." *Indonesian Journal of Science & Technology 4*, no. 2 (2019):204-219. https://doi.org/10.17509/ijost.v4i2.18177.

[26] Waqas, S. and Bilad, M. R. "A review on rotating biological contactors." *Indonesian Journal of Science and Technology 4*, no. 2 (2019):241-256, https://doi.org/10.17509/ijost.v4i2.18181

[27] Nurprasetio, I. P., Budiman, B. A., and Triawan, F. "Failure investigation of plastic shredding machine's flange coupling based on mechanical analysis." *Indonesian Journal of Science and Technology 2*, no. 2 (2017):124-133, https://doi.org/10.17509/ijost.v2i2.7988

[28] Lrhoul, H., Turki, H., Hammouti, B., and Benammar, O. "Internationalization of the moroccan journal of chemistry: A bibliometric study." *Heliyon 9*, no. 5 (2023) 1-10. https://doi.org/10.1016/j.heliyon.2023.e15857

[29] Hamidah, I., Sriyono, S., and Hudha, M. N. A Bibliometric analysis of Covid-19 research using VOSviewer, Indonesian Journal of Science and Technology 5 (2) (2020) 34-41. https://doi.org/10.17509/ijost.v5i2.24522

[30] Setiyo, M., Yuvenda, D., and Samuel, O. D. The concise latest report on the advantages and disadvantages of pure biodiesel (B100) on engine performance: Literature review and bibliometric analysis, *Indonesian Journal of Science and Technology 6*, no. 3 (2021):469-490. https://doi.org/10.17509/ijost.v6i3.38430.

[31] Soegoto, H., Soeryanto Soegoto, E., Luckyardi, S., and Abhi Rafdhi, A. "A bibliometric analysis of management bioenergy research using vosviewer application." *Indonesian Journal of Science and Technology 7*, no. 1 (2022):89-104. https://doi.org/10.17509/ijost.v7i1.43328.

[32] Mudzakir, A., Rizky, K. M., Munawaroh, H. S. H., and Puspitasari, D. "Oil palm empty fruit bunch waste pretreatment with benzotriazolium-based ionic liquids for cellulose conversion to glucose: Experiments with computational bibliometric analysis." *Indonesian Journal of Science and Technology 7*, no. 2 (2022):291-310. https://doi.org/10.17509/ijost.v7i2.50800.

[33] Hamidah, I., Ramdhani, R., Wiyono, A., Mulyanti, B., Pawinanto, R. E., Hasanah, L., and Rusydi, A. "Biomass-based supercapacitors electrodes for electrical energy storage systems activated using chemical activation method: A literature review and bibliometric analysis." *Indonesian Journal of Science and Technology 8*, no. 3 (2023):439-468. https://doi.org/10.17509/ijost.v8i3.60688.

[34] Ramadhan, D. F., Fabian, A. M., and Saputra, H. M. "Dental suction aerosol: Bibliometric analysis." *ASEAN Journal of Science and Engineering 2*, no. 3 (2022):295-302. https://doi.org/10.17509/ajse.v2i3.50658.

[35] Shidiq, A. P. "A bibliometric analysis of nano metal-organic frameworks synthesis research in medical science using VOSviewer." *ASEAN Journal of Science and Engineering 3*, no. 1 (2023):31-38. https://doi.org/10.17509/ajse.v3i1.43345.

[36] Ruzmetov, A. and Ibragimov, A. "Past, current and future trends of salicylic acid and its derivatives: A bibliometric review of papers from the Scopus database published from 2000 to 2021." *ASEAN Journal for Science and Engineering in Materials 2*, no. 1 (2023):53-68.

[37] Nordin, N. A. H. M. "Correlation between process engineering and special needs from bibliometric analysis perspectives." *ASEAN Journal of Community and Special Needs Education 1*, no. 1 (2022):9-16.

[38] Bilad, M. R. "Bibliometric analysis for understanding the correlation between chemistry and special needs education using vosviewer indexed by google." *ASEAN Journal of Community and Special Needs Education 1*, no. 2 (2022):61-68.

[39] Sudarjat, H. "Computing bibliometric analysis with mapping visualization using vosviewer on "pharmacy" and "special needs" research Data in 2017-2021." *ASEAN Journal of Community and Special Needs Education 2,* no. 1 (2023):1-8.

[40] Firdaus, I. R., Febrianty, M. F., Awwaludin, P. N., Ilsya, M. N. F., Nurcahya, Y., and Sultoni, K. "Nutritional research mapping for endurance sports: A bibliometric analysis." *ASEAN Journal of Physical Education and Sport Science 2,* no. 1 (2023):23-38.

[41] Mulyawati, I. B. and Ramadhan, D. F. "Bibliometric and visualized analysis of scientific publications on geotechnics fields." *ASEAN Journal of Science and Engineering Education 1*, no. 1 (2021):37-46.

[42] Nordin, N. A. H. M. "A bibliometric analysis of computational mapping on publishing teaching science engineering using VOSviewer application and correlation." *Indonesian Journal of Teaching in Science 2*, no. 2 (2022):127-138. https://doi.org/10.17509/ijotis.v2i2.47038.

[43] Wirzal, M. D. H., and Putra, Z. A. "What is the correlation between chemical engineering and special needs education from the perspective of bibliometric analysis using vosviewer indexed by google scholar." *Indonesian Journal of Community and Special Needs Education 2,* no. 2 (2022):103-110. https://doi.org/10.17509/ijcsne.v2i2.44581.

[44] Solehuddin, M., Muktiarni, M., Rahayu, N. I., and Maryanti, R. "Counseling guidance in science education: Definition, literature review, and bibliometric analysis." *Journal of Engineering Science and Technology18*, (2023):1-13.

[45] Sahidin, I., Nohong, N., Manggau, M. A., Arfan, A., Wahyuni, W., Meylani, I., and Muktiarni, M. "Phytochemical profile and biological activities of ethylacetate extract of peanut (Arachis hypogaea L.) stems: In-vitro and in-silico studies with bibliometric analysis." *Indonesian Journal of Science and Technology 8*, no. 2, (2023):217-242. https://doi.org/10.17509/ijost.v8i2.54822.

[46] Nandiyanto, A. B. D. and Al Husaeni, D. F. "A bibliometric analysis of materials research in Indonesian journal using VOSviewer." *Journal of Engineering Research 2021*, (2021):1-16. https://doi.org/10.36909/jer.ASSEEE.16037.

[47] Nandiyanto, A. B. D., Ragadhita, R., Al Husaeni, D. N., and Nugraha, W. C. "Research trend on the use of mercury in gold mining: Literature review and bibliometric analysis." *Moroccan Journal of Chemistry 11,* no. 1 (2023a):1-11. https://doi.org/10.48317/IMIST.PRSM/morjchem-v11i1.36576.

[48] Al Husaeni, D. F., Nandiyanto, A. B. D., and Maryanti, R. "Bibliometric analysis of educational research in 2017 to 2021 using VOSviewer: Google scholar indexed research." *Indonesian Journal of Teaching in Science 3*, no. 1 (2023a):1-8. https://doi.org/10.17509/ijotis.v3i1.43182.

[49] Al Husaeni, D. N., Nandiyanto, A. B. D., and Maryanti, R. "Bibliometric analysis of special needs education keyword using VOSviewer indexed by google scholar". *Indonesian Journal of Community and Special Needs Education 3*, no. 1 (2023b):1-10. https://doi.org/10.17509/ijcsne.v3i1.43181.

[50] Maryanti, R., Rahayu, N.I., Muktiarni, M. Al Husaeni, D.F., Hufad, A., Sunardi, S., and Nandiyanto, A.B.D. "Sustainable development goals (SDGs) in science education: Definition, literature review, and bibliometric analysis." *Journal of Engineering Science and Technology 17*, (2022):161-181.

[51] Nandiyanto, A.B.D., Al Husaeni, D.N., and Al Husaeni, D.F. "A bibliometric analysis of chemical engineering research using vosviewer and its correlation with covid-19 pandemic condition." *Journal of Engineering Science and Technology 16*, no. 6 (2021): 4414-4422.

[52] Al Husaeni, D.F., and Al Husaeni, D.N. "Computational bibliometric analysis of research on science and Islam with VOSviewer: Scopus database in 2012 to 2022." *ASEAN Journal of Religion, Education, and Society 1*, no. 1 (2022): 39-48.

[53] Nandiyanto, A.B.D., Al Husaeni, D.N., Ragadhita, R., Fiandini, M., Al Husaeni, D.F., and Aziz, M. "Resin matrix composition on the performance of brake pads made from durian seeds: From computational bibliometric literature analysis to experiment." *Automotive Experiences 5*, no. 3 (2022): 328-342. https://doi.org/10.31603/ae.6852

[54] Al Husaeni, D.N. "Bibliometric analysis of briquette research trends during the covid-19 pandemic." *ASEAN Journal for Science and Engineering in Materials 1*, no. 2 (2022): 99-106.

[55] Ragadhita, R., and Nandiyanto, A.B.D. "Computational bibliometric analysis on publication of techno-economic education." *Indonesian Journal of Multidiciplinary Research 2*, no. 1 (2022): 213-222. https://doi.org/10.17509/ijomr.v2i1.43180

[56] Nandiyanto, A.B.D., Biddinika, M.K., and Triawan, F. "How bibliographic dataset portrays decreasing number of scientific publication from Indonesia." *Indonesian Journal of Science and Technology 5*, no. 1 (2020): 154-175. https://doi.org/10.17509/ijost.v5i1.22265

[57] Nandiyanto, A.B.D., Fiandini, M., and Al Husaeni, D.N. "Research trends from the scopus database using keyword water hyacinth and ecosystem: A bibliometric literature review." *ASEAN Journal of Science and Engineering 4*, no. 1 (2024): 33-48. https://doi.org/10.17509/ajse.v4i1.60149

[58] Al Husaeni, D.N., and Nandiyanto, A.B.D. "Bibliometric analysis of high school keyword using VOSviewer indexed by google scholar." *Indonesian Journal of Educational Research and Technology 3*, no. 1 (2023): 1-12. https://doi.org/10.17509/ijert.v3i1.43112

[59] Al Husaeni, D.N., and Al Husaeni, D.F. "How to calculate bibliometric using vosviewer with publish or perish (using scopus data): Science education keywords." *Indonesian Journal of Educational Research and Technology 2*, no. 3 (2023): 247-274. https://doi.org/10.17509/ijert.v4i1.57213

[60] Nursaniah, S.S.J., and Nandiyanto, A.B.D. "Bibliometric analysis for understanding "science education" for "student with special needs" using vosviewer." *ASEAN Journal of Community and Special Needs Education 2*, no. 1 (2023): 45-54.

[61] Al Husaeni, D.N. "Bibliometric analysis of research development in sports science with vosviewer." *ASEAN Journal of Physical Education and Sport Science 2*, no. 1 (2023): 9-16.

[62] Nandiyanto, A.B.D., and Al Husaeni, D.F. "Bibliometric analysis of engineering research using vosviewer indexed by google scholar." *Journal of Engineering Science and Technology 17*, no. 2 (2022): 883-894.

[63] Al Husaeni, D.F., and Nandiyanto, A.B.D. "Bibliometric computational mapping analysis of publications on mechanical engineering education using vosviewer." *Journal of Engineering Science and Technology 17*, no. 2 (2022): 1135-1149.

[64] Al Husaeni, D.F., and Nandiyanto, A.B.D. "Bibliometric using vosviewer with publish or perish (using google scholar data): From step-by-step processing for users to the practical examples in the analysis of digital learning articles in pre and post Covid-19 pandemic." *ASEAN Journal of Science and Engineering 2*, no. 1 (2022): 19-46. https://doi.org/10.17509/ajse.v2i1.37368

[65] Goertz, G., and Mahoney, J. "Scope in case study research." *The Sage Handbook of Case-Based Methods*, (2009): 307-317.

[66] Braun, T., and Nagy, J. "A comparative evaluation of some Hungarian and other national biology, chemistry, mathematics and physics journals." *Scientometrics 4*, no. 6 (1982): 439-455, https://doi.org/10.1007/bf02021140

[67] Nandiyanto, A.B.D., Al Husaeni, D.F., and Ragadhita, R. "Bibliometric data analysis of research on resin-based brake-pads from 2012 to 2021 using VOSviewer mapping analysis computations, *ASEAN Journal for Science and Engineering in Materials 2*, no 1 (2023): 35-44.

[68] Derrick, G.E., Meijer, I., and van Wijk, E. "Unwrapping "impact" for evaluation: A co-word analysis of the UK REF2014 policy documents using VOSviewer." *Proceedings of the Science and Technology Indicators Conference 2014*, (2014): 145-154.

[69] Rahindra, A.H., and Astuti, A.W. "Pengaruh presidensi G20 terhadap manajemen talenta nasional bidang riset dan inovasi di Indonesia." *Jurnal Analis Kebijakan 6*, no. 1 (2022): 1-17. https://doi.org/10.37145/jak.v6i1.459