Introducing ASEAN Journal of Science and Engineering: A Bibliometric Analysis Study

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ARTICLE INFO	ABSTRACT
           	This study aims to analyze bibliographic data from publications in the ASEAN Journal of Science and Engineering (AJSE) between 2021 and 2023. This research is conducted to verify the impact of AJSE on local research and find out whether this journal has been successful in its quest for internationalization. The method used in this research is bibliometric analysis using Publish or Perish, VOSviewer, and R Studio. The Google Scholar and Scopus database is used to get article data. Publish or Perish is used for article data collection, VOSviewer is used for data mapping, and R Studio is used to analyze publication progress. Based on the research results, journal editors with a homogeneous scope can increase the value of publications. In addition, it was identified that AJSE could become a medium for cooperation with international countries outside of Asian countries, confirmed by many authors from more than 24 countries in 5 continents involved. This research is expected to be a reference for researchers who would publish their articles in journals, and it is also hoped that this research can provide motivation and increase the enthusiasm of local (Indonesian), regional (ASEAN), as well as international researchers to conduct research, especially in the field of science and engineering. Indeed, these science and engineering results can support current issues in the sustainable development goals (SDGs).

1. Introduction

For decades, scientific journals have been featured as the primary vehicle for disseminating research findings and developing communication between the scientific community as an important tool in developing science and technology. Scientific journals can not only provide information but also serve as a tool for researchers to publish their research results [1]. Thus, the results of his research can be accessed and used by the public at large. Currently, many have established journals both open- and close-access [2-3].

The entry of the digital era at this time brought changes in the world of research, many countries on all continents established research journals, including Indonesia. In Indonesia, there are already scientific journals that even have a history of more than a decade. Several journals have been

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successfully indexed in the Directory of Open Access Journals (DOAJ). DOAJ is a community-curated database of trusted open-access research journals created in 2003 and available at https://doaj.org [3-5]. As of July 31, 2023, it was recorded that 2,299 journals originating from Indonesia had been indexed by DOAJ. Apart from being listed as DOAJ, Indonesia also has 8,881 journals and 1,395 publishers recorded on the Indonesian Science and Technology Index (SINTA). SINTA is an online scientific page or portal managed by the Ministry of Education and Culture and Research and Technology. It presents a list of accredited national journals [6-8]

The ASEAN Journal of Science and Engineering (AJSE) is a journal under the auspices of the Universitas Pendidikan Indonesia (UPI) (https://ejournal.upi.edu/index.php/AJSE), which is the best university in education in Indonesia. AJSE is a journal that has been nationally and internationally accredited (SINTA 1 and SCOPUS). AJSE is an open-access and peer-reviewed journal, becoming a medium for disseminating research results from scientists and engineers in various fields of science and technology. AJSE publishes articles three times a year in March, September, and December. AJSE has been involved with several countries and institutions in more than 24 countries around the world, including Indonesia, Philippines, India, Thailand, Malaysia, Pakistan, the United Arab Emirates, Nigeria, the United States of America, Vietnam, Qatar, Algeria, Ethiopia, Sweden, Uzbekistan, Japan, Zimbabwe, Poland, Bangladesh, Tunisia, Mauritania, the Russian Federation, Brazil, and Libya. AJSE is one of the excellent journals in Indonesia due to its excellent citations (see Figure 1). One of the best articles published in 2022 has been cited 80 times, which is categorized as excellent in its field. The top 25 best papers are in Table 1.
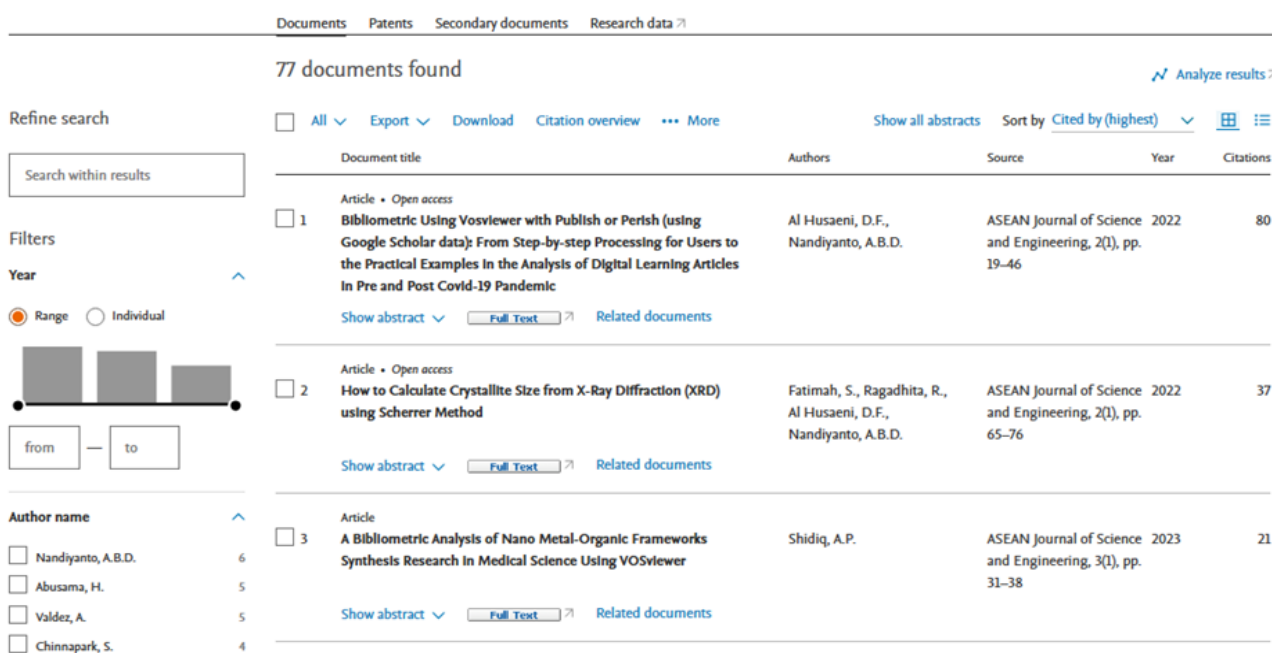

Fig. 1. Appearance of the most cited articles taken from Scopus on 2 August 2023

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 2 is our works. In general, the use of bibliometric analysis to explore and visualize the current literature is very effective. In addition, bibliometric analysis can be used to decide whether further research would be continued or not. However, among the studies that have been carried out, there are still few or none that discuss the impact of international journals using bibliographical analysis.

Table 1
Top cited articles in AJSE

No.	Document title	Authors	Year	Citations	Ref
1	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	Al Husaeni and Nandiyanto	2022	80	[9]
2	How to Calculate Crystallite Size from X-Ray Diffraction (XRD) using Scherrer Method	Fatimah *et al.*,	2022	38	[10]
3	A Bibliometric Analysis of Nano Metal-Organic Frameworks Synthesis Research in Medical Science Using VOSviewer	Shidiq	2023	21	[11]
4	Illizi city sand impact on the output of a conventional solar still	Khamaia *et al.*,	2022	9	[12]
5	Evaluation of FTIR, Macro and Micronutrients of Compost from Black Soldier Fly Residual: in Context of Its Use as Fertilizer	Sukamto and Rahmat	2023	8	[13]
6	Pollutant Emissions from Brick Kilns and Their Effects on Climate Change and Agriculture	Asif *et al.*,	2021	8	[14]
7	Mesh Network Based on MQTT Broker for Smart Home and IIoT Factory	Anh, D.H.M.	2022	6	[15]
8	Anthocyanins from Agro-waste as Time-Temperature Indicator to Monitor Freshness of Fish Products	Ramadhan and Handayani	2021	6	[16]
9	Techno-Economic Evaluation of Hyaluronic Acid Nanoparticles Production Through Extraction Method using Yellowfin Tuna Eyeball	Elia *et al.*,	2023	5	[17]
10	Assessment and Optimization of Coagulation Process in Water Treatment Plant: A Review	Sheng *et al.*,	2023	4	[18]
11	Electrical Characterization of II-VI Thin Films for Solar Cells Application	Ahmad *et al.*,	2022	4	[19]
12	Eco-Friendly Concrete Innovation in Civil Engineering	Ghinaya and Masek	2021	4	[20]
13	Eco-Friendly Batteries from Rice Husks and Wood Grain	Nurjamil *et al.*,	2021	4	[21]
14	Bioactive Compounds and Antioxidant Activity of Ethanol Leaf Extract of Eucalyptus Tereticornis	Ebulue	2023	3	[22]
15	Dental Suction Aerosol: Bibliometric Analysis	Ramadhan *et al.*,	2022	3	[23]
16	Clean Energy Production from Jatropha Plant as Renewable Energy Source of Biodiesel	Kareem *et al.*,	2022	3	[24]
17	Building Information Modeling (BIM) as Tool to Develop Solution for Bridge Rehabilitation	Vanjari and Kulkarni	2022	3	[25]
18	Performance Assessment of Gravity Retaining Wall with Rubber Tyre Waste mixed in dry cohesionless Backfill	Kantroo *et al.*,	2022	3	[26]
19	Comparative Study on Extraction of Humic Acid from Pakistani Coal Samples by Oxidizing the Samples with Hydrogen Peroxide	Asif, M.	2022	3	[27]
20	Foldable Bed Design Concept for COVID-19 Patient: A Machine Design Case Study	Muryanti *et al.*,	2021	3	[28]
21	Frequent Items Mining on Data Streams using Matrix and Scan Reduced Indexing Algorithms	Vijayarani *et al.*,	2023	2	[29]
22	Correlation among Construction, Safety, Accident, and the Effectiveness Construction Industry Development Board (CIDB) Green Card Training Program: An Initial Review	Wahab *et al.*,	2023	2	[30]
23	The Effectiveness of Mugwort Leaf Extract and Gotu Kola Leaf Extract against Acne Bacterial Activity	Sari *et al.*,	2022	2	[31]
24	Potential Production of Bioplastic from Water Hyacinth (Eichornia crassipes)	Duruin *et al.*,	2022	2	[32]
25	Bioplastic from Seaweeds (Eucheuma Cottonii) as an Alternative Plastic	Consebit *et al.*,	2022	2	[33]

In this research paper, we analyzed bibliographic data from publications in AJSE between 2021 and 2023 to verify whether this journal has succeeded in its quest for internationalization and its impact. This would be reliable evidence to know whether the free non-predatory open access publishing model is. AJSE has been shown in improving and reaching its reputation efficiency. In this research, we would limit our internationalization assessment to study the world's contribution to AJSE. This research is expected to be a material consideration for authors who would publish their articles in AJSE.

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 Mor. J. Chem. in internationalization.	[5]
2	Dental suction aerosol: Bibliometric analysis.	This study explains development of dental aerosol suction through the distribution of bibliometrics maps and research trends using VOSViewer.	[39]
3	A bibliometric analysis of covid-19 research using VOSviewer.	This study discusses the development of research during the Covid-19 era using bibliometric analysis.	[34]
4	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.	[35]
5	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.	[36]
6	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 VOSviewer.	[37]
7	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.	[38]
8	Management information systems: bibliometric analysis and its effect on decision making.	This study discusses the information regarding decision making	[39]
9	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.	[40]
10	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.	[41]
11	Correlation between process engineering and special needs from bibliometric analysis perspectives.	This study discusses the integration of mapping analysis using the VOSviewer program.	[42]
12	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.	[43]
13	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).	[44]
14	Nutritional research mapping for endurance sports: A bibliometric analysis.	This study discusses research mapping in the field of nutrition for endurance sports.	[45]

Table 2 (continue)

Previous studies of bibliometric analysis

No	Title	Topic Discussion	Ref
15	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.	[46]
16	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.	[47]
17	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.	[48]
18	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.	[49]
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.	[50]

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.	[51]
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.	[52]
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.	[53]
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.	[54]
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.	[55]
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.	[56]
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.	[57]
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.	[58]
9.	Bibliometric Analysis of Briquette Research Trends During the Covid-19 Pandemic.	This paper examines briquette research trends during the Covid-19 epidemic.	[59]
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.	[60]

Table 3 (continue)

Our works in bibliometric analysis

No	Title	Topic Discussion	Ref
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.	[61]
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.	[62]
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.	[63]
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.	[64]
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.	[65]
16	Bibliometric analysis of research development in sports science with vosviewer.	This study examines the development of research in sports science.	[66]
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.	[67]
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.	[68]

In addition, this research is expected to be a reference for researchers who would publish their articles in journals, and it is also hoped that this research can provide motivation and increase the enthusiasm of local (Indonesian), regional (ASEAN), as well as international researchers to conduct research, especially in the field of science and engineering. Indeed, these science and engineering results can support current issues in the sustainable development goals (SDGs).

2. Methodology

In this study, we retrieved all bibliographic data from articles published in AJSE between 2021 and 2023 using the Publish or Perish application (which was accessed on 01 August 2023) with the database Scopus (which was accessed on 02 August 2023). Publish or Perish result data would then be saved in three formats namely *.ris (for data mapping using the VOSviewer application), *.bip (for analysis with R Studio), and *.csv (for data processing in Ms.Excel). The data taken is data from articles that have been published starting from the year of publication, author's name, author's country, and keywords. Once the data is captured, we use the VOSviewer application as a data visualization tool that generates a network from the pre-processed data set, to build a scient metric network that outlines productivity. AJSE is used as a search keyword (publication name) in the Publish or Perish application and Scopus website (https://www.scopus.com). Further explanation regarding the steps of the bibliometric analysis research carried out is shown in Figure 2.
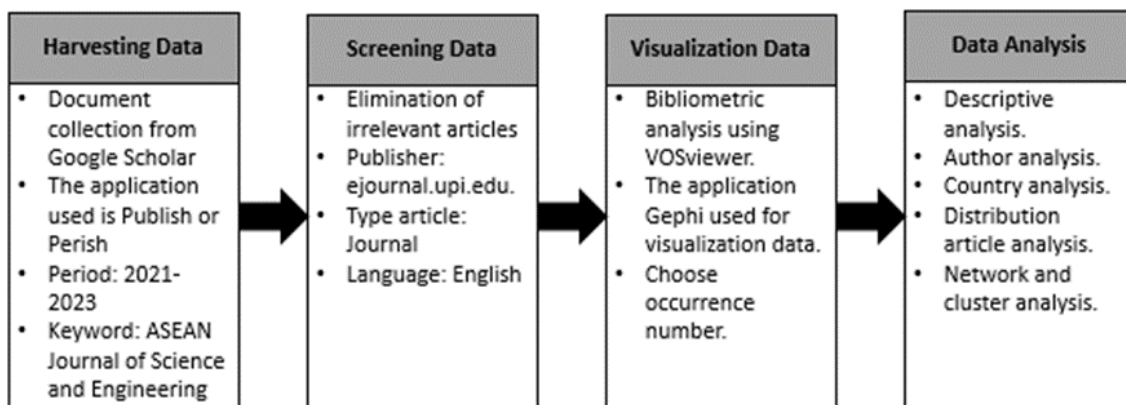
Harvesting Data	Screening Data	Visualization Data	Data Analysis
• Document collection from Google Scholar • The application used is Publish or Perish • Period: 2021-2023 • Keyword: ASEAN Journal of Science and Engineering	• Elimination of irrelevant articles • Publisher: ejournal.upi.edu. • Type article: Journal • Language: English	• Bibliometric analysis using VOSviewer. • The application Gephi used for visualization data. • Choose occurrence number.	• Descriptive analysis. • Author analysis. • Country analysis. • Distribution article analysis. • Network and cluster analysis.

Fig. 2. Step by step conducting a bibliometric analysis

2.1 Harvesting Data

At this stage, we collect data for trend analysis and identify the impact of AJSE journal on research publications. At this stage, published research documents (articles) related to a particular topic are collected using the Publish or Perish application and from the Scopus website directly. Publish or Perish is an application that can be used to collect article data based on keywords, authors, publication names, and title words. Research documents are collected using the publication name AJSE. The article data taken is data from articles published in 2021 (the first time AJSE was formed) to 2023 (the year this research was conducted). Data collection using the Publish or Perish application has been fully explained in our previous research [69-71].

2.2 Screening Data

Research documents collected during stage 1 cannot be analyzed directly. As a result, data filtering is required. At this stage, data screening is carried out by paying attention to the year of publication and publisher. Articles whose year of publication is missing and not published by the publisher ejournal.upi.edu are eliminated. The elimination process is carried out in the Publish or Perish application and Microsoft Excel. After screening the data, 106 relevant articles were obtained. Finally, the collected research document data is stored in three formats, namely format (*.csv). Thus, it can be analyzed with Microsoft Excel software, format (*.ris) so that data mapping can be done using the VOSviewer application, and format (*.BibText). Thus, it can be analyzed using R Studio.

2.3. Visualization Data

The data that has been saved in the format (*.ris) is then uploaded to the VOSviewer application to get the data mapping results. The terms in the VOSviewer network mapping visualization are filtered at this stage. The source database is used to map the article data.

2.4 Analysis Data

Data that has been visualized and exported to R Studio and Ms. Excel is analyzed in such a way as to obtain the results of research developments per year, the authors with the most research, the country, and the relationship between the authors and other authors and countries with other countries. In addition, the clusters obtained from the visualization results are analyzed at this stage.

3. Results

While retrieving bibliographic data from research articles issued by AJSE, we have successfully identified that the journal has successfully obtained a community of confirmed authors. All articles obtained are journal articles. The distribution of publications per year shown in Figure 3 proves that the journal has published more than 100 articles over the last 3 years (2021-2023). In addition, the number of publications in the 2023 AJSE has increased significantly proving and confirming the benefits of having an open-access publication model where researchers can share their research results for free [5]. When assessing the collaboration network of journal authors (Figure 4), we found that there were cluster groups that were not tied to one another. Of the 78 cluster groups, there is one cluster group (Figure 5) that dominates the number of publications in AJSE. This group is Cluster 1 which is connected to Cluster 36. Authors from clusters 1 and 35 are identified as lecturers and students at an Indonesian university. Authors in Cluster 1 and Cluster 35 are the most productive authors. Those in Clusters 1 and 35 are Nandiyanto (Editor, 6 Documents), Kurniawan (1 document), Firman (1 document), Hernawati (1 document), Yolanda (1 document), Khamsah (1 document), Al Husaeni (Journal Manager, 3 documents), Ragadhita (2 documents), and Fatimah (1 document). This reveals that AJSE is widely used by local researchers to publish their research results.

A comparison of the main authors of journal publications with the list of the most productive researchers in AJSE from 2021 – 2023 identified that two of the ten main authors are among the most productive authors with the highest number of citations, namely 236 and 235 from each author (see Table 4). Both authors are part of the management of the journal AJSE with their reputation being able to attract local researchers to publish their articles in AJSE. This confirms that some of the journals publish articles that are of high enough quality only if the management of the journal is homogeneous and includes many respected editors [72].
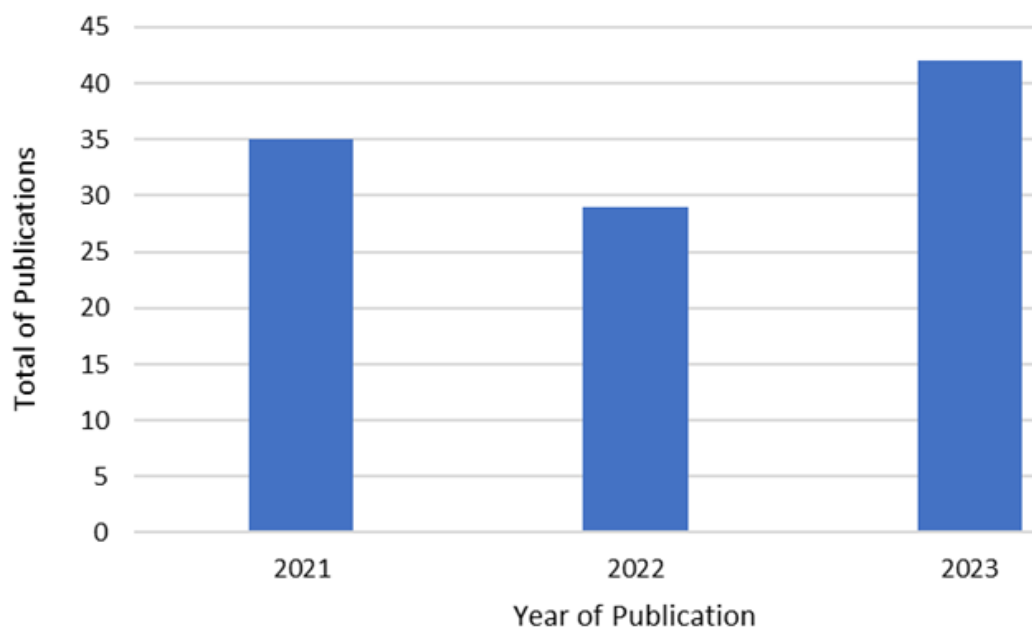

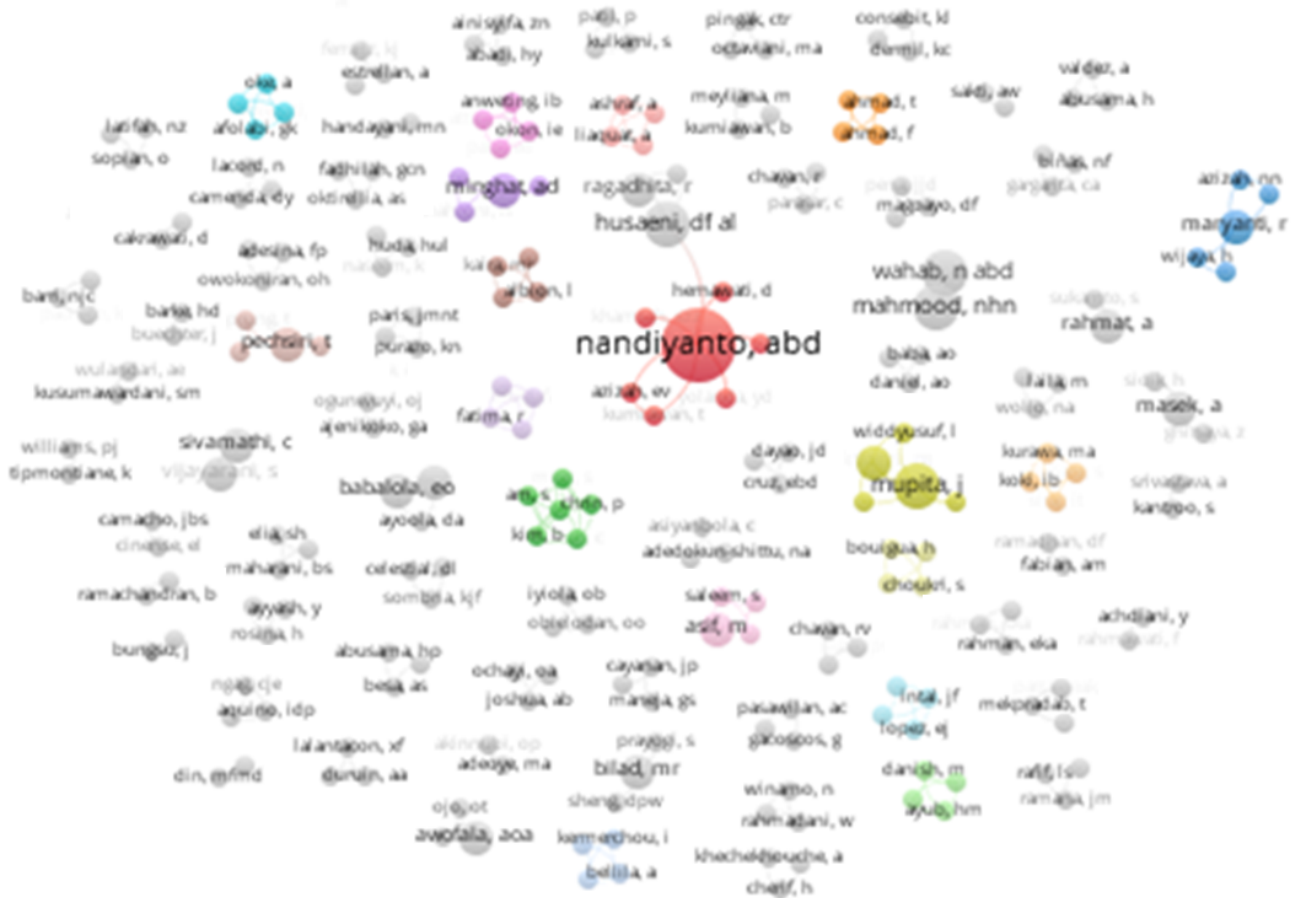**Fig. 3**. Distribution of research papers from AJSE per year of publication

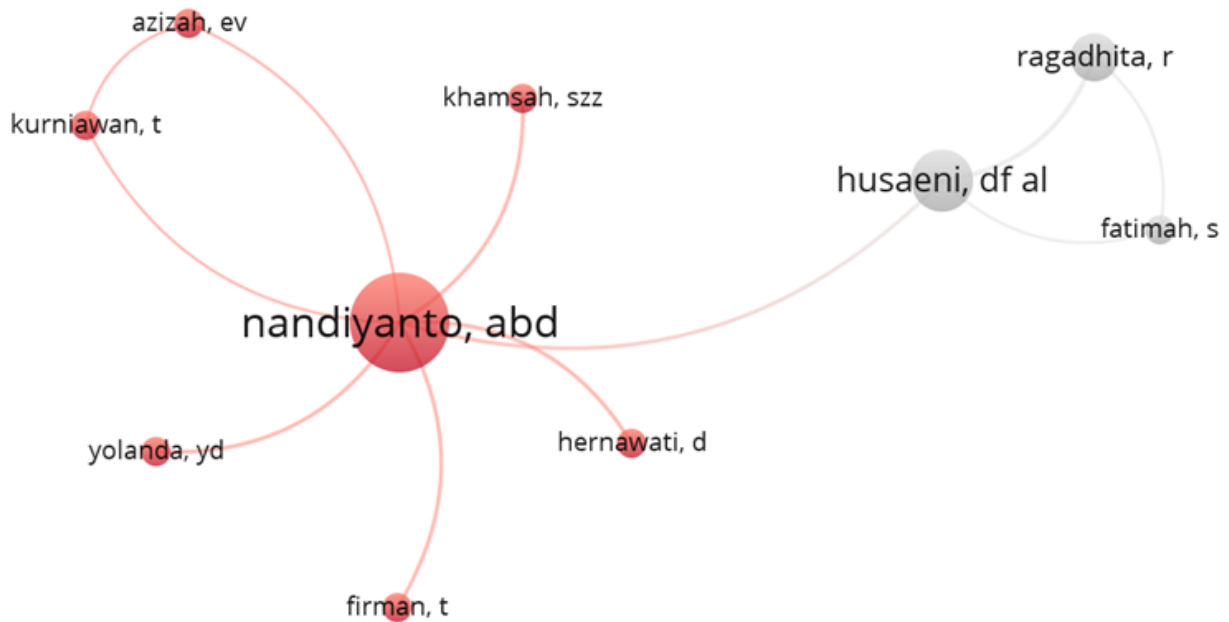**Fig. 4**. Author collaboration network in AJSE

Fig. 5. Author collaboration network in AJSE with the most publications

Table 4
The ten most productive AJSE researchers from 2021-2023

Rating	Researcher	Number of Documents	Total Citations
1	Nandiyanto, A. B. D.	6	236
2	Al Husaeni, D. F.	3	235
3	Mahmood, N. H. N.	3	5
4	Mupita, J.	3	11
5	Wahab, N. A. B. D.	3	5
6	Babalola, E. O.	2	0
7	Bilad, M. R.	2	11
8	Maryanti, R.	2	13
9	Masek, A.	2	9
10	Minghat, A. D.	2	1

When analyzing which countries have actively contributed to publishing their articles in AJSE, we found that Indonesia is the country with the most publications in journals as shown in Figure 6 with a rate of 24.77% (27 out of 109 publications). This confirms previous findings regarding the publication bias of the country of origin, especially those related to the exact sciences [73,5]. Even though 24.77% of journals published in AJSE are articles originating from Indonesian researchers, 75.23% of publications are not from local (Indonesian) researchers. This proves that AJSE is not limited to the local community and is open to researchers worldwide. It also proves that there has been a successful internationalization of AJSE.
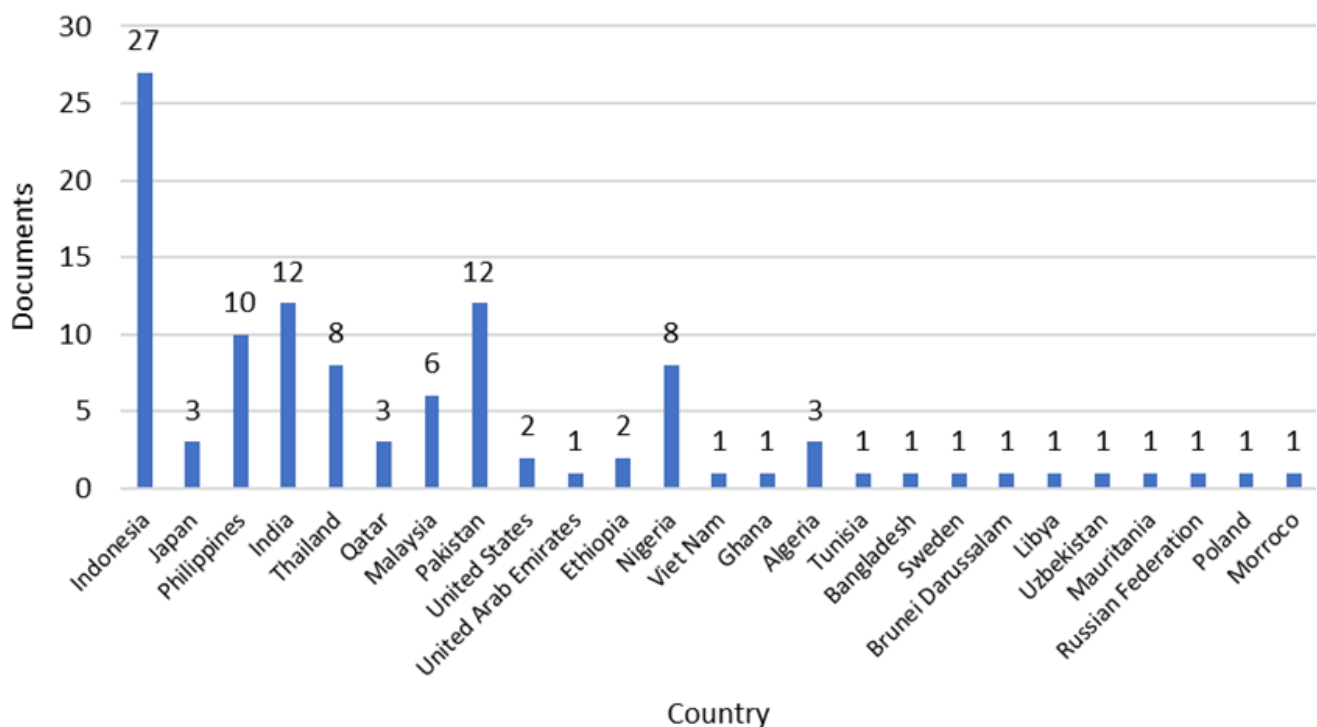

Fig. 6. Countries contributing to AJSE

Even though Indonesia is the most dominating country in terms of cooperation with AJSE as shown in Figure 7, Indonesia's publication numbers have fluctuated (see Table 3). In 2022 the number of Indonesian state publications in AJSE decreased from the previous year, namely from 37.04% (10 of 27 publications) to 29.63% (8 of 27 publications), and in 2023 increased again, namely from 29.63% (8 of 27 publications) to 33.33 % (9 of 27 publications).
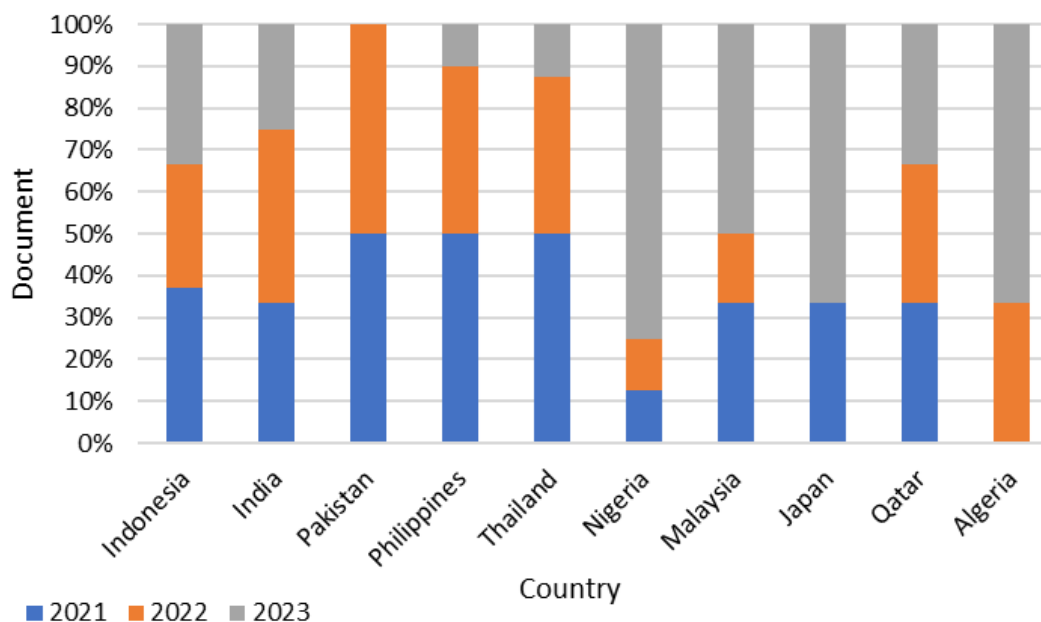
Fig. 7. Annual distribution of scientific contributions from countries most published in AJSE

In addition, in Table 5, the dominating countries are Asian countries (Indonesia, India, Pakistan, Philippines, Thailand, Malaysia, Japan, and Qatar). These Asian countries surprisingly became the main collaborators of AJSE because these countries were included in the 10 countries with the highest number of publications in the last 3 years (2021-2023). In addition, it was found that Nigeria and Algeria were included in the 10 countries with the highest number of publications in AJSE (Table 5) due to the peak of publications in AJSE in 2023 (Figure 3). This confirms that AJSE can serve as an incubator to build international collaborations beyond Asian countries.

Table 5
The ten most productive countries publish their articles in AJSE in 2021-2023

Rating	Country	2021	2022	2023	Total of Publications	Percentage (%)
1	Indonesia	10	8	9	27	24.77
2	India	4	5	3	12	11.00
3	Pakistan	6	6	0	12	11.00
4	Philippines	5	4	1	10	9.17
5	Thailand	4	3	1	8	7.33
6	Nigeria	1	1	6	8	7.33
7	Malaysia	2	1	3	6	5.50
8	Japan	1	0	2	3	2.75
9	Qatar	1	1	1	3	2.75
10	Algeria	0	1	2	3	2.75

When analyzing articles published in AJSE based on keywords with the VOSviewer application, we found that most of the published terms related to science are linked to Education as shown in Figure 8. This is due to the management of AJSE in UPI which is the best educational university in Indonesia. In addition, in Figure 8, it can be seen that the results of the visualization provide 7 cluster groups, namely cluster 1 (assessment, challenge, challenges, concept, covid, field, outcome, school, student, use), cluster 2 (analysis, country, data, investigation, person, study, year), cluster 3 (article, development, education, life, review, voltage), cluster 4 (area, bachelor, mathematics, Nigeria,

science, university), cluster 5 (behavior, effectiveness, impact, paper, performance), cluster 6 (effect, learning, problem, research, solution), and cluster 7 (elementary school student, ICT, and medium).
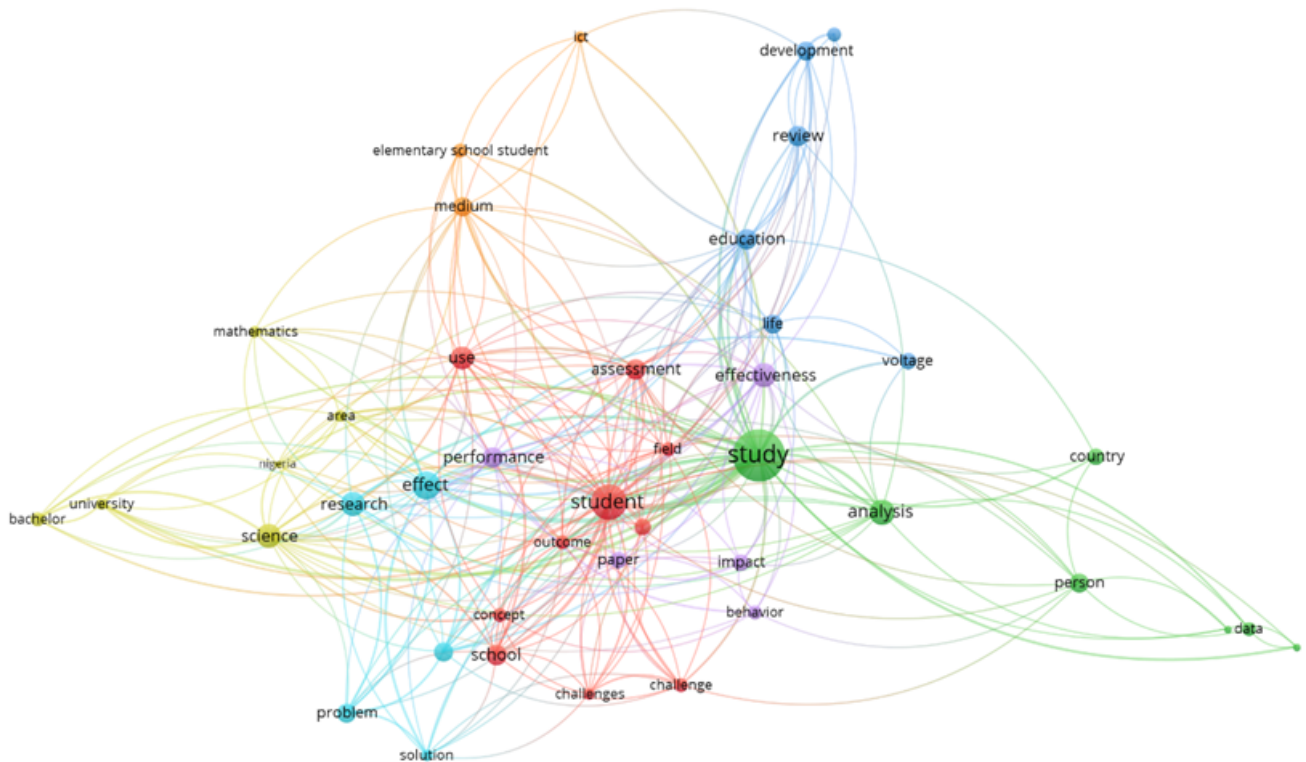

Fig. 8. Co-occurrence Network of the Keywords from research papers published in AJSE from 2021-2023

In addition, based on the analysis results from the Scopus database, it is known that only 77 out of 106 articles were identified, and three subject areas are often used by researchers in AJSE, namely Chemical Engineering Chemistry, Chemistry, and Engineering (Figure 9) with all journal article type document.
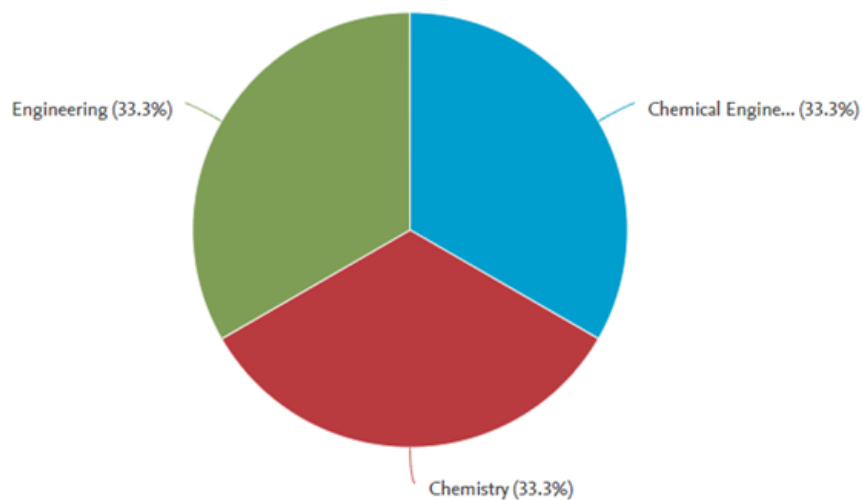

Fig. 9. Document by Subject Area

In detail, the recap of publication data at AJSE starting from the number of articles, the number of countries, the number of affiliations, to the number of authors can be seen in Figure 10. Figure 10 shows that in volume 1 Issue 1 consists of 10 articles from 52 authors affiliated with 6 institutions from 7 countries. Volume 1 Issue 2 consists of 10 articles from 44 authors affiliated with 14 institutions from 5 countries. Volume 1 Issue 3 consists of 11 articles from 42 authors affiliated with 11 institutions from 7 countries. Volume 2 Issue 1 consists of 10 articles from 41 authors affiliated with 11 institutions from 7 countries. Volume 2 Issue 2 consists of 11 articles from 56 authors affiliated with 12 institutions from 8 countries. Volume 2 Issue 3 consists of 11 articles from 34 authors affiliated with 19 institutions from 8 countries. Volume 3 Issue 1 consists of 10 articles from 32 authors affiliated with 15 institutions from 7 countries. Volume 3 Issue 2 consists of 10 articles from 35 authors affiliated with 21 institutions from 8 countries. Meanwhile, volume 3 Issue 3 consists of 12 articles from 41 authors affiliated with 22 institutions from 9 countries. These results indicate that the longer the age of the journal, the more contributions from the state and the more diverse its affiliations.
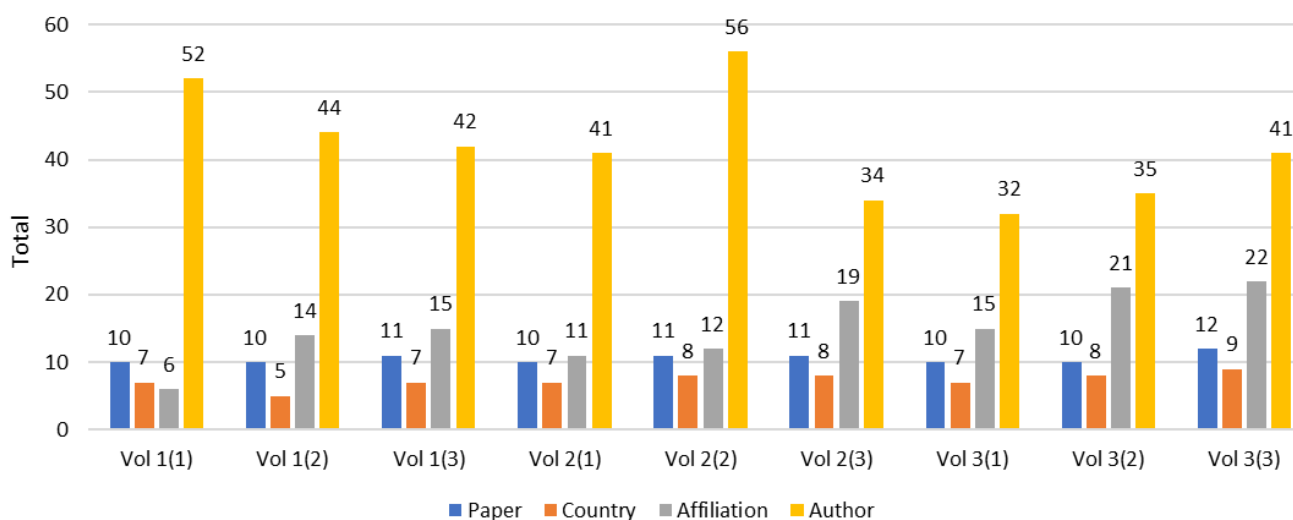

Fig. 10. Publications Data in AJSE

Finally, this study is important for confirming the internationalization of AJSE. In addition, since the data was obtained from the Scopus database, some articles published in 2023 and 2024 were not detected. These papers have been well-cited in the secondary document analysis in the Scopus database, such as references [74] and [75] published in 2023 which have been cited 3 and 2 times. Also for reference [76] and [77] were published in 2024 with citations of 1 time for each paper.

4. Conclusion

This research paper analyzed the output of AJSE from 2021 to 2023 by assessing bibliographic data using various tools such as Publish or Perish. Then, we analyzed the impact of the development and internationalization of AJSE on the local research community. We found that AJSE has thrived thanks to its free open-access research policy. On the other hand, the journal has succeeded in raising various topics, especially those related to Chemical Engineering, Chemistry, and Engineering. On the other hand, the journal encourages local and international research networks by making the journal a forum for discussing and enhancing Indonesia's initial research initiatives in the field of science and engineering. Its reaches contribution from at least more than 24 countries. In addition, this journal is very useful for launching new research collaborations with other countries, both Asian countries

(Indonesia, India, Pakistan, Philippines, Thailand, Malaysia, Japan, and Qatar) and non-Asian countries such as Nigeria and Algeria in the African continent.

This internationalization encourages the development of international cooperation networks for local (Indonesian) researchers, which leads to an increase in the scope of topics and the diversity of research results. Collaboration between Indonesian and international researchers guarantees greater visibility and impact for researchers. In addition, we identified that journals can be media and models for developing collaboration.

Acknowledgment

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