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A SCIENTOMETRICS ANALYSIS OF THE RESEARCH PRODUCTIVITY OF PAKUAN UNIVERSITY (UNPAK) AS EVIDENCED IN THE SCOPUS DATABASE FROM 2010 TO 2024

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Abstract. This study examines Pakuan University's scholarly output from 2010 to 2024 using Scopus data. The investigation encompassed research productivity, trends, subject areas, publication sources, author contributions, and collaborative efforts. Pakuan University produced 685 papers, with Scopus publications showing rapid growth, with a 32.7% yearly increase. An average citation count of 3,867 per document suggests a moderate impact. Among 1,780 contributing authors, only 12 papers were single-authored, emphasising the prevalence of collaborative research. The primary research domains include Engineering, Physics and Astronomy, Environmental Sciences, Social Science, and Computer Science. Recent research has focused on topics such as in silico, sustainability, job satisfaction, and smart villages. The main publication outlets are conference proceedings and journals, notably the IOP Conference Series, AIP Conference Proceedings, International Journal of Recent Technology and Engineering, and Journal of Engineering Science and Technology. The five most productive authors are Anna Permanasari, Diana Widiastuti, Eneng Tita Tosida, Johan Iskandar and Mochamad Yunus, whilst the most influential are Anna Permanasari, Diana Widiastuti, Eneng Tita Tosida and Dolly Priatna. The Faculty of Mathematics and Natural Sciences (FMIPA) leads in contributions, followed by the postgraduate school and the faculty of engineering. Collaborative publications are predominantly from Indonesian institutions, such as the Indonesian Education University and IPB University, with international partnerships including Japan, Malaysia, and China.

Keywords: bibliometric; Universitas Pakuan; scientometric; scopus.

I. INTRODUCTION

The number of literature in these fields has expanded tremendously due to various research communities. Given the increasing publications and scientific diversity in disciplines, a comprehensive analysis of the intellectual structure is needed to detect emerging trends, new advances, past innovations, and present issues [1]. In order to study, understand and teach science properly, it is commonly divided into different knowledge areas. With the accelerated growth of knowledge and the concomitant increase in the number of people forming scientific communities in each of these fields, over time each of these fields was divided into fields, subfields, specialties, and specialties. rice field. Each unit in which scientific knowledge is structured has its own epistemological properties (objects, principles, methods), giving it its own identity and the boundaries that delimit its perceptual scope. The boundary between inner and outer is not always clear. There are overlaps between disciplines, gaps and loops, sometimes very vague and difficult to track [2].

Scientometrics is the quantitative and qualitative evaluation of scientific literature [3]. It involves measuring and analyzing science, technology, and innovation [4]. Scientometric analysis is used to study publication trends, author distributions, geographical distribution, citations distribution, and other parameters in various research fields [5], [6], and it has become a key factor in research performance evaluation [7].

According [8] scientometric study is methods to investigate many aspects of research in the domain of social support in education. These aspects include research trends, publishing and citation structures, authorship and cooperation patterns, bibliographic coupling, and productivity patterns. Scientometrics focuses on quantitatively analyzing scientific and technical literature. It is rooted in the tradition of the science of science (intersection of Sociology, History, and Philosophy of science), to which science policy is also connected. For this scientometric orientation, the establishment of Citation indexes (databases devoted to the collection of scientific output) was essential [2]. The journal is considered essential for both research workers and research administrators due to its comprehensive multidisciplinary nature. This resource offers significant support to librarians and documentalists working at central scientific agencies, ministries, research institutes, and laboratories [9].

An institution's research papers are stressed as a technique of measuring criteria for showcasing its performance. It is an

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aspect of the academic life that makes the system effective and productive for an academic institution. In addition, the government and funding agencies have begun providing cash based on performance and research output. Collaborations on scientific papers increase the organization's global profile and bring additional recognition and financial incentives. Universities create research output as a source of fresh knowledge while also providing academic support to help the country develop for a knowledge-based society. To find solutions to issues, research must be conducted scientifically, utilizing legitimate and reliable research technique and tools. Scientometric methods and approaches are effective mechanisms that can be utilized as measurements of research performance to show the performance and reputation of researchers and institutions. Scientometrics, as a new evaluation method, assesses scientific activities such as research publications, academic and scientific achievements. These studies can substantially assist policymakers in analyzing research trends, performance, and productivity, as well as determining future steps to improve its efficiency.

In practical application, there exists a notable convergence between scientometrics and adjacent fields including bibliometrics, informetrics, webometrics, and cybermetrics. Bibliometrics is a well-established area of study within the field of library and information science, focusing on the quantitative analysis of textual publications. Informetrics is an academic discipline that focuses on the quantitative examination of many aspects of information. It is considered a comprehensive field that encompasses and extends beyond other related domains. The authors [10] present a comprehensive depiction of the interrelationships among different domains, as illustrated in Figure 1.

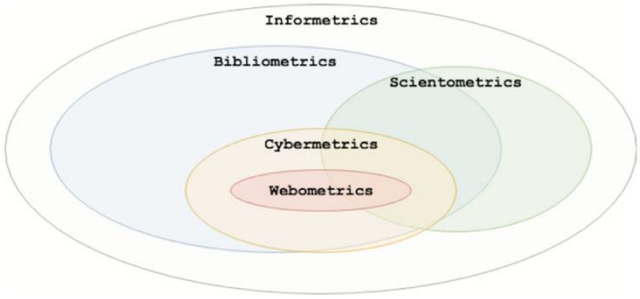

Fig. 1 Relationships between the fields of metrics [10]

Pakuan University is located at Bogor City in Indonesia. The university was established in 1980 and is being accredited with Grade-B by the National Accreditation Agency for Higher Education (BAN-PT), an organisation that assesses and accredits the Higher Education Institutions in Indonesia. Pakuan University is a private university that is ranked in the top 100 nationally in Indonesia and ranked 2nd in the Bogor region [11]. In 2024, the accreditation increased to excellent (Unggul) and became ranked in the top 80 nationally [12]. This shows the increasing competitiveness of Pakuan University as an educational institution in Indonesia.

The goal of this study is to assess Pakuan University's research production utilizing several scientometric criteria. The report depicts the outcome of a scientometric estimate of research productivity from 2010 to 2024. The Scopus database, an internationally recognized indexing and citation analysis database of Elsevier, was utilized to extract data for the given period. For the evaluation, many criteria and scientometric parameters are applied. The analysis and visualization are carried out using a variety of qualitative and quantitative measurements. The study's findings and conclusions are based on the overall publication output, its growth rate, the quality of papers published, global ranking, national and international levels of collaborative works shared, citation impacts, and so on

II. REVIEW OF LITERATURE

A comprehensive review of scholarly literature on scientometric evaluations of various organisational research outputs has been conducted. Numerous studies have been carried out by different researchers, examining various organisations across different time periods using diverse data analysis tools. The following summarises key findings from relevant research studies that support the current investigation. Research output of Guru Nanak Dev University in physics and astronomy, utilising 652 Scopus entries from 2006 to 2015. The findings were presented in terms of publication output (652), h-index (29), average citations per paper (7.01%), proportion of highly cited papers (1%), and international collaborative papers (27.45%). The university ranked 19th among Indian universities during this period. Approximately 68.71% of the university's publications in physics and astronomy involved collaborations with GNDU and other Indian institutions. The data clearly indicates that journals are the preferred medium for scholars to disseminate their research work [13]. A scientometric analysis of publications affiliated with Savitribai Phule Pune University in Pune from 2001 to 2019. The study analysed 6449 papers, employing the Specialisation Index and Research Priority Index to evaluate disciplines and sub-disciplines in Chemistry, Physics, Biology, and Engineering. This comprehensive examination aims to identify and analyse the relative strengths and weaknesses across these four key academic fields. The study quantifies and illustrates the university's research efforts in relation to national and global research in similar subject areas. "Physics" was identified as a specialised field at the university, with an SI Index Value of 1.455. The research revealed that the sub-subjects 'Medical Chemistry', 'Polymer Science', 'Microbiology', and 'Biotechnology Applied Microbiology' received the highest research priority, with PI Values of 333.2, 757.87, 1090.51, and 936.9 in Chemistry, Physics, Biology, and Engineering, respectively. These sub-subjects align with national research productivity goals in these areas. The study presents various rankings, including author productivity, most cited authors, author impact measured by h-index, g-index, and m-index, as well as the most referenced and most contributed journals [14].

The scholarly output of VSS University of Technology as recorded in the Scopus database. The study analysed 1889 documents, revealing an overall upward trend in publications year-on-year, with notable decreases in 2013 and 2017. The university's faculty demonstrated particular expertise in

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Physics and Astronomy, contributing 197 (11%) of the total publications. Furthermore, the institution exhibited international collaborations, notably with the United States and Italy [15]. [16] conducted an investigation into the research productivity of West Bengal universities from 2002 to 2021. The study identified a strong preference for journal articles as the primary publication format among these institutions. In 2021, Vidyasagar University achieved the highest Relative Growth Rate (RGR), while the University of Calcutta recorded the lowest. The research examined publication patterns through Domestic and International Collaboration variables. Findings indicated that the majority of papers, 11,529 (38.38%), were published domestically. Jadavpur University led in international publications with 3,140 (43.87%) papers. Open access research articles constituted 16.82% of total publications, numbering 6255. Notably, Jadavpur University demonstrated a significant commitment to open access publishing, with 33.78% of its output in this category. The most prolific author identified was Subhadeep Das from Jadavpur University's Department of Life Sciences and Biotechnology, who ranked highest with 908 papers.

This study's primary objective is to evaluate the research output of Pakuan University almost a quarter of a century, from 2010 to 2024. However, the research seeks to accomplish the following specific goals:

1. To identify the scientific production of Pakuan University;
2. To identify the annual development pattern of research publications at Pakuan University;
3. To describe the research subject trends of Pakuan University;
4. To identify productivity of scopus publication sources Pakuan University authors;
5. To identify prolific authors and patterns of authorship in research publications;
6. To determine the institutions' collaboration and funding

III. RESEARCH METHODS

The data for the present bibliometric investigation came from Scopus, a product of Elsevier, is the largest abstract and citation database of peer-reviewed literature, including scientific journals, novels, and conference proceedings. Scopus was queried for Pakuan University research published between 2010 until 2024, the largest abstract and citation database, using Affiliations with keywords “Pakuan University ". The search string used for the study is AF-ID ("Pakuan University " 60110394) AND (LIMIT-TO (LANGUAGE , "English") and (limit-to (PUBSTAGE , "final")). A total 685 article records were found in the search result. Further, the study is based on the complete count of year-wise growth patterns of publications, authorship pattern, collaborative institutions, countries and document types. The retrieved data was analysed using the the R tool [17] and VosViewer [18] and MS-excel sheet and for visualisation of data the Vosviewer software used. VOSviewer was employed to illustrate the study of cooperation mapping and the visualization of three-field plots (Country, Authors, Keywords) through the usage of a Sankey diagram [9].

IV. RESULTS AND DISCUSSION

A. Overview Annual scientific production of Pakuan University

Details of Pakuan University research publications on the Scopus database published between 2010 and 2024 are presented in Table 1. In this time span, 257 unique sources, including journals, books, and other publications, have contributed to the 685 documents analyzed. Scopus publications at Pakuan University are growing rapidly, with an annual growth rate of 32.7%, indicating a surge in research output in recent years. The average age of the documents is 4.24 years, indicating that most of the research is recent, reflecting the dynamic nature of the field. On average, each document has been cited 3,867 times, indicating a moderate level of impact, although it shows that the research is still in its infancy. A total of 1,780 authors have contributed to these documents, with only 12 articles producing work written by one person, which is only a small portion of the total. This highlights the collaborative nature of the research, as the average number of co-authors per document is 4.95. Furthermore, approximately 16.35% of the documents involve international co-authorship, indicating global interest in the topic. In terms of document type, journal articles dominate, with 366 published, followed by 300 conference papers. There are also small numbers of book chapters (4), data papers (1), editorials (4), letters (1), notes (1), and reviews (8), with the majority of research disseminated through journal articles and conferences. Overall, this dataset reflects a rapidly growing publication landscape, with high levels of collaboration both domestically and internationally. The relatively low average citations per document suggests that the field is still developing, but the substantial growth rate suggests a promising trajectory for future impact and recognition.

TABLE I
ANNUAL SCIENTIFIC PRODUCTION

Description	Results
Timespan	2010:2024
Sources (Journals, Books, etc)	257
Documents	685
Annual Growth Rate %	32.7
Document Average Age	4.24
Average citations per doc	3.867
Authors	1780
Authors of single-authored docs	12
Single-authored docs	17
Co-Authors per Doc	4.95
International co-authorships %	16.35
Article	366
Book chapter	4
Conference paper	300
Data paper	1
Editorial	4
Letter	1

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Note	1
Review	8

B. Annual development pattern of Pakuan University's research publications

A total 685 numbers of research papers were produced and indexed on scopus during 2010-2024. Therefore, the average annual productivity is 32,7 and the productivity is increasing gradually form 2016 – 2022. The year 2019 have maximum research papers 108 while the lowest in 2011 and 2012 with no publications (Fig.2).

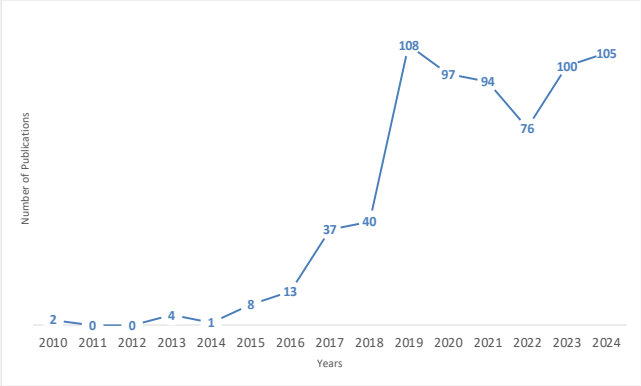

Fig. 2 Publication trends in scopus at Pakuan University

Table 2 shows year-wise growth of publications and average citations per paper. A total of 685 publications were discovered between 2010 until 2024. From the data, it is known that in the early years, the number of publications was relatively modest, with only 2 publications in 2010, representing 0.29% of the total publications. These early works garnered a total of 2 citations, with an average of 0.09 citations per paper, reflecting the early stage of research in the field. Publication output began to experience significant growth starting in 2013, with a significant 100% increase from the previous year, resulting in 4 publications. However, the number of citations remained low, garnering only 4 citations, with citations per paper of 0.02, indicating limited direct impact. A more prominent spike in the number of publications of Pakuan University occurred in 2015, when the total number of publications increased by 700% to 8, with corresponding citations increasing to 8, and citations per paper of 0.37. This year marked the beginning of a stronger publication trajectory.

From 2016 onwards, the number of publications continued to increase, with a significant increase in 2016, when 13 papers were published, representing a 62.5% increase from the previous year. Citations also increased to 13, resulting in a higher citations per paper of 2.1. This upward trajectory in publications and citations continued into 2017, when 37 publications were produced, an increase of 184.6% from the previous year, with a corresponding increase in citations to 37. Citations per paper remained relatively modest at 0.76, reflecting a continuing but still limited direct impact of research. The period from 2018 to 2020 saw research output remain high, with 40 publications in 2018, 97 in 2020, and 94 in 2021. Although these results are stable, the annual growth rate has slowed, with slight decreases in 2020 (-10.2%) and 2021 (-3.1%). Citations per paper during these years vary, peaking at 0.85 in 2020, but generally reflect a modest impact in terms of citations, with averages ranging from 0.57 to 0.85. In 2022, there was a slight decline in total publications to 76, a 19.1% decrease from the previous year. However, the average citations per paper rose to 1.07, indicating that research conducted during this period had a somewhat greater direct impact. Publication numbers increased again in 2023, reaching 100 publications, a 31.6% increase from the previous year, although citations per paper fell to 0.5, reflecting a decline in citation impact despite increased output. Finally, in 2024, the field saw a further increase in publications to 105, accounting for 15.33% of the total publications in the dataset. The annual growth rate slowed to 5%, and citations per paper fell to 0.33, indicating that while research output remains high, its direct impact in terms of citations has declined.

Overall, the dataset reveals a clear growth trend in research output, especially from 2016 onwards, with fluctuations in both annual growth rates and citations per paper. The early years (2010–2015) reflect a slow development phase, while the period between 2016 and 2019 saw a significant increase in publications and citations. However, the last few years (2020–2024) show a slowdown in both growth rates and citation impact, indicating a shift towards more stable research output, with less direct recognition or citations. This suggests that while the field is productive, there may be challenges in achieving sustained academic impact, which requires further exploration of the factors that influence citation trends and overall research visibility.

TABLE II
YEAR GROWTH OF PUBLICATIONS AND CITATIONS

Years	TP	%TP	AGR	TC	CPP
2010	2	0.29		2	0.09
2013	4	0.58	100.0	4	0.02
2014	1	0.15	-75.0	1	0.08
2015	8	1.17	700.0	8	0.37
2016	13	1.90	62.5	13	2.1
2017	37	5.40	184.6	37	0.76
2018	40	5.84	8.1	40	0.85
2019	108	15.77	170.0	108	0.57
2020	97	14.16	-10.2	97	0.85
2021	94	13.72	-3.1	94	0.72
2022	76	11.09	-19.1	76	1.07
2023	100	14.60	31.6	100	0.5
2024	105	15.33	5.0	105	0.33
Total	685	100.00	32.7	685	3.87

TP = Total Publications, AGR= Annual Growth Rate, TC= Total Citation, CPP= Citation Per Paper

C. Research subject trends of pakuan university

The distribution of research subjects from Pakuan University covers a wide range of academic disciplines, with an emphasis on natural sciences, applied sciences, and social sciences (Fig.2). Engineering leads with 183 publications, followed by Physics and Astronomy (141) and Environmental Science (121), underscoring the prominence of technical,

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scientific, and environmental research. Significant contributions are also evident in Social Sciences (116), Computer Science (97), and Business, Management, and Accounting (84), reflecting the interdisciplinary nature of modern research. The life sciences are represented by Agricultural and Biological Sciences (52), Biochemistry, Genetics, and Molecular Biology (47), and Pharmacology, Toxicology, and Pharmaceutics (44), highlighting ongoing advancements in health and biological research. Other fields, such as Earth and Planetary Sciences (78), Materials Science (60), and Decision Sciences (60), indicate a growing focus on both fundamental and applied research in natural sciences, technology, and decision-making processes. While areas like Mathematics (23), Energy (23), and Medicine (20) demonstrate important yet smaller contributions, niche fields such as Psychology (1) and Dentistry (2) contribute to specialized academic discourse. Overall, the data reflects the breadth of contemporary academic research, with significant attention given to global challenges, technological innovation, and interdisciplinary studies.

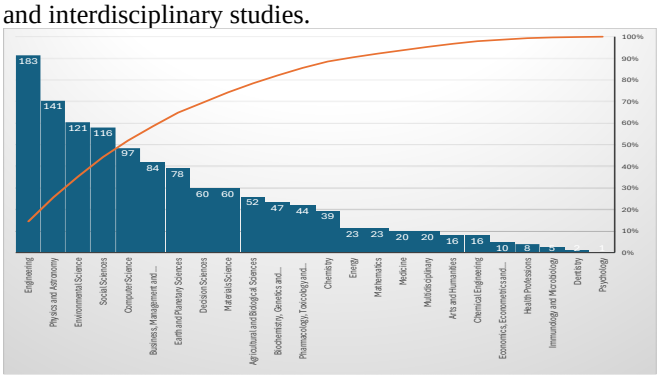

Fig. 3 Subject trends in scopus at Pakuan University

The visualization in Figure 4 presents a summary of 14 topics over the past 24 years. By examining the occurrence of terms categorized into five frequency levels (5, 7.5, 10, 12.5, 15). The dataset provides an overview of topic trends in academic research over several years, revealing shifts in focus across different fields. Topics such as "fdtd method" and "scientific literacy" show steady relevance from 2014 to 2020, indicating sustained interest in these topics. In contrast, terms like "smart village" and "job satisfaction" have gained significant attention since 2022, highlighting emerging research areas. Keywords related to technology and optimization, such as "optimization," "genetic algorithm," and "clustering," reflect growing interest in these areas from 2019 to 2023. Additionally, the impact of the COVID-19 pandemic is evident, with "covid-19" peaking in 2021, while sustainability-related topics have progressively gained importance from 2019 to 2024. This data illustrates the dynamic nature of academic research, where topics evolve in response to technological advancements and global events.

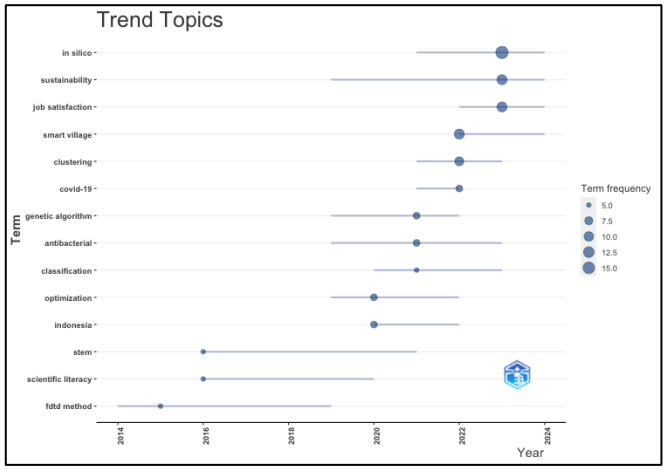

Fig. 4 Trend topic of publications based on Pakuan University

The provided table highlights author keywords associated with specific research clusters, their relevance indicated by the "Closeness" metric. Key findings include:

1. **Cluster 1** primarily focuses on **in silico**, **antibacterial**, and **antioxidant** studies, with a strong emphasis on molecular biology and chemical analysis (e.g., **molecular docking**, **flavonoid**, **cytotoxicity**).
2. **Cluster 2** revolves around **job satisfaction**, **transformational leadership**, and **e-learning**, emphasizing education, leadership, and organizational performance, with the highest closeness metric attributed to **self-efficacy**.
3. **Cluster 3** is centered on **conservation**, **empowerment**, and **biodiversity**, reflecting a focus on ecological and community studies, supported by tools like **data mining**.
4. **Cluster 4** highlights **smart village**, **COVID-19**, and **local wisdom**, with a particular interest in digital transformation, agriculture, and citizen science methodologies.
5. **Cluster 5** stands out for **sustainability**, with extraordinarily high closeness metrics for topics like **optimization**, **developing countries**, and **petrochemical**, showcasing their strategic relevance.
6. **Cluster 6** is dominated by **scientific literacy** and **STEM**, reflecting foundational priorities in science education and pedagogy, with the highest possible closeness values.

The data underscores diverse academic interests, with clusters emphasizing both niche and overarching themes across various disciplines.

Bibliometric analysis visualization using R biblioshiny reveals the progression of research studies across different time periods, a process known as thematic evolution [19]. This analytical approach employs an inclusion weight index based on word frequency and utilizes a walktrap clustering algorithm. The resulting thematic evolution diagram illustrates the historical development of the research topic on one side and its current state on the opposite side. In the earliest period (2010–2018), the primary focus was on scientific literacy. This theme persists into subsequent years but diversifies in the 2019–2022 period, where additional

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topics emerge, including empowerment, in silico, low carbon education, smart village, earthquake, optimization, COVID-19, antibacterial, and Indonesia.

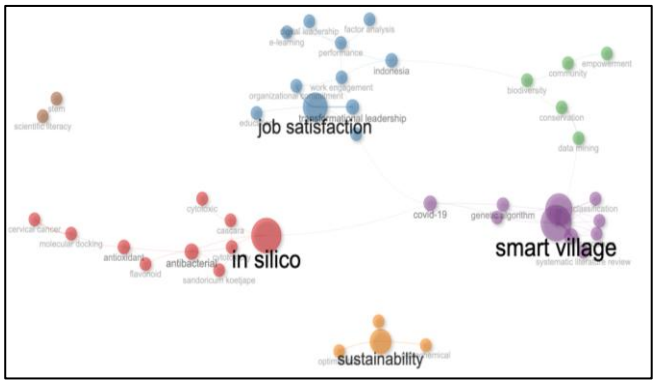

Fig. 5 Production of publications based on faculty homebase

In the most recent period (2023–2024), the topics shift further to include bibliometric analysis, biodiversity, job satisfaction, sustainability, and service quality, alongside continuing interest in in silico and smart village. The diagram illustrates how research interests have expanded and evolved, reflecting changing priorities and emerging areas of importance in academia

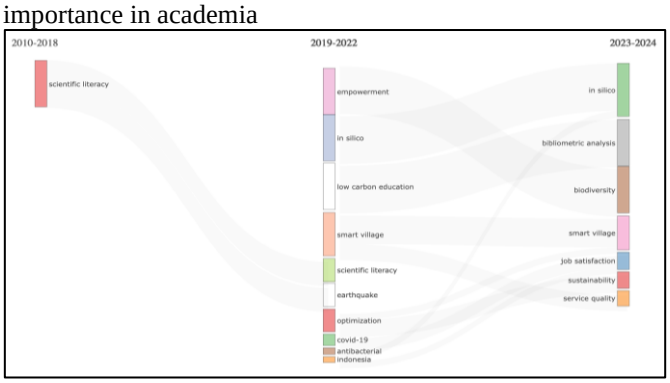

Fig. 6 Thematic evolution based on keywords in publications at pakuan university

D. Most productive publication source

Based on the analysis (fig 7), Pakuan University's Scopus publications are primarily from conference proceedings and journals. IOP Conference Series: Earth and Environmental Science and Journal of Physics: Conference Series lead with 62 publications each. AIP Conference Proceedings (45 articles) and IOP Conference Series: Materials Science and Engineering (37 articles) follow, indicating strong contributions in engineering, environmental science, and physics. The International Journal of Recent Technology and Engineering (25 articles) and Journal of Engineering Science and Technology (20 articles) further emphasize technological and engineering research. Specialized journals like the International Journal of Innovation, Creativity and Change and Malaysian Journal of Biochemistry and Molecular Biology contribute 8 articles each, showcasing niche study areas. Smaller sources such as Systematic Reviews in Pharmacy (7 articles) and Forests (5 articles) demonstrate valuable but less extensive contributions. The data shows a concentration of research in prominent conference series and journals, with specialized publications providing insights across diverse academic fields.

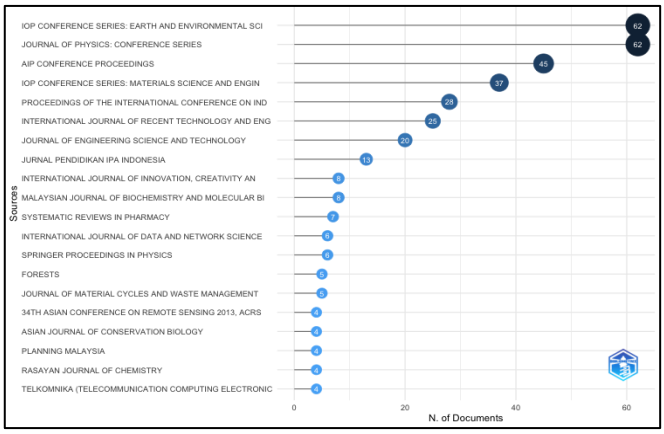

Fig. 7 Most productive source of Pakuan University publications

Based on production time, IOP Conference Series: Earth and Environmental Science emerged as a dominant source, with increased publications from 2016 onwards. In 2024, 62 articles were published, with peaks in 2016 (17 articles), 2017 (12 articles), and 2018 (13 articles). The publisher experienced a decline in subsequent years, with only 3 publications in 2020 and 2 in 2021, before regaining momentum in 2022 and 2023. Journal of Physics: Conference Series showed a steady increase starting in 2013, with 62 articles in 2024. The journal recorded significant production between 2017 and 2019, peaking at 18 publications in 2017 and 12 in 2018, although activity declined in 2020 and 2021. AIP Conference Proceedings followed an irregular pattern, with 45 publications concentrated in 2014-2021. After a slow start, it increased publications in 2019 (10 articles) and 2021 (7 articles), but with fewer contributions in early and late years. IOP Conference Series: Materials Science and Engineering had a strong presence in 2016-2018, producing 37 articles. Its output dropped sharply in 2019, with no publications after 2018. International Journal of Recent Technology and Engineering showed a sharp increase in 2020, contributing 25 articles. Journal of Engineering Science and Technology contributed 20 articles between 2013 and 2024, peaking in 2016 with 6 articles. Jurnal Pendidikan IPA Indonesia produced 6 articles in 2015. International Journal of Innovation, Creativity and Change published 8 articles, with similar distribution in 2019 and 2020. Malaysian Journal of Biochemistry and Molecular Biology published 3 articles in 2017 and 2018. Systematic Reviews in Pharmacy experienced a surge in 2021, with 7 articles. International Journal of Data and Network Science published 6 articles throughout 2022-2024. Springer Proceedings in Physics and Forests have limited contributions, with 6 and 5 articles respectively, mostly published in 2022. Journal of Material Cycles and Waste Management contributed 5 articles in 2022 and 2023.

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Publisher	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total Articles
Iop Conference Series Earth And Environmental Science								1	2	17	12	13	3	2	12	62
Journal Of Physics Conference Series							1	7	6	18	12	18				62
Aip Conference Proceedings	2					1	2	1	2	1	5	6	10	8	7	45
Iop Conference Series Materials Science And Engineering								12	12	11	2					37
International Journal Of Recent Technology And Engineering										25						25
Journal Of Engineering Science And Technology										1	5	2	6	5	1	20
Jurnal Pendidikan IPA Indonesia							6	1	1	2		1	1		1	13
International Journal Of Innovation Creativity And Change										4	4					8
Malaysian Journal Of Biochemistry And Molecular Biology											3	3	1	1		8
systematic Reviews In Pharmacy											7					7
International Journal Of Data And Network Science													1	3	2	6
Springer Proceedings In Physics														6		6
Forests													2	3		5
Journal Of Material Cycles And Waste Management													2		3	5

Fig. 8 Source production over time

E. Prolific authors and patterns of authorship in research publications

The following table 3, shows the ranking of authors who contributed minimum 15 articles. From the Scopus dataset, a total of 1780 unique authors. The most productive author with maximum number of contributions i.e., 90 is Anna Permanasari got the first rank followed by Diana Widiastuti with 41 articles and Eneng Tita Tosida with 35 contribution of article and placed at third rank.

TABLE III
RANGKING OF AUTHORS

No.	Author	TP	TC	*h*-index
1	Permanasari, Anna	90	761	15
2	Widiastuti, Diana	41	139	7
3	Tosida, Eneng Tita	35	137	7
4	Iskandar, Johan	28	142	6
5	Yunus, Mochamad	27	90	5
6	Heliawati, Leny	22	120	6
7	Priatna, Dolly	22	304	7
8	Mulyati, Ade Heri	19	57	5
	Wihartiko, Fajar		85	4
9	Delli	16		
10	Iryani, Ani	16	95	6
11	Rubini, Bibin	16	114	6
12	Warnasih, Siti	15	36	4
13	Negara, Teguh Puja	15	11	2

TP = Total Publications, TC= Total Citation

The dataset delineates publication trends of various authors at Pakuan University from 2010 to 2024, elucidating both consistent and fluctuating research outputs. Anna Permanasari consistently demonstrates a high publication volume, particularly between 2016 and 2022, with a notable decline in 2023 and 2024. Diana Widiastuti exhibits steady growth in publications, reaching a peak in 2023 and 2024. Eneng Tita Tosida displays a significant increase in 2020, followed by a subsequent decline, while M. Yunus demonstrates fluctuating output, with notable peaks in 2019 and 2024. Other authors, such as Leni Heliawati, Ade Heri Mulyati, and Fajar Delli Wihartiko, exhibit varying degrees of publication stability, with some years showing increased output, such as Ade Heri Mulyati, in 2021 and 2024. Bibin Rubini presents a more sporadic publication pattern, while Dolly Priatna and Johan Iskandar demonstrate steady productivity. This pattern suggests variation in individual research trajectories, which may be influenced by external factors such as project phase, research collaborations, and academic interests (Fig 9).

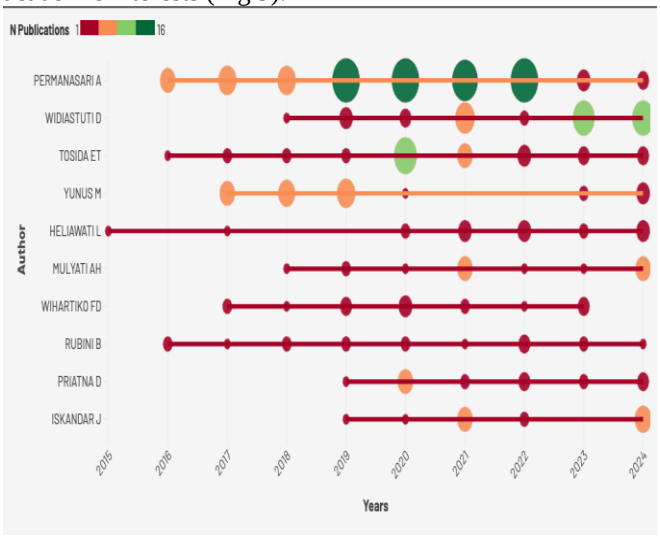

Fig. 9 Authors production over time

Grouping based on publication patterns or research fields is known to consist of 8 groups (fig.10). These groupings generally follow the home base of the authors themselves such as Group 1 includes authors such as Putra GR, Sardjono W, and Denih A which is part of FMIPA, indicating a smaller group of researchers. Group 2 displays productive authors from postgraduate school such as Permanasari A, Suhandi A, and Rachman I, indicating a group with moderate publication results. Group 3 consists of Widiastuti D, Putra WE, and Sustiprijatno, among others, indicating a larger or more diverse research group. Group 4, which includes authors such as Sunaryo W and Notosudjono D, indicates a specialized but smaller group of researchers. Authors in Cluster 5, such as Tosida ET, Ardiansyah D, and Wihartiko FD, have demonstrated significant contributions, perhaps in a specific research domain. Cluster 6 contains influential authors such as Heliawati L, Rubini B, and Pursitasari ID, who may represent focused research in a specific discipline. Cluster 7, with Alatas H, Iskandar J, and Irzaman, indicates a group with high research visibility or collaborative work. Finally, Cluster 8, consisting of authors from Faculty of Engineering such as Munir A, Yunus M, and Tan Y. These clusters highlight the diversity of publication patterns and research focuses among the authors.

Based on the faculty homebase, it is known that the data illustrate the distribution of research contributions across faculties (Fig. 11). Faculty of Mathematics and Natural Sciences (FMIPA) leads with the highest contribution of 38%, reflecting significant involvement in mathematics and natural sciences. Graduate School (SPS) follows at 22%, indicating strong participation from the School of Graduate Studies.

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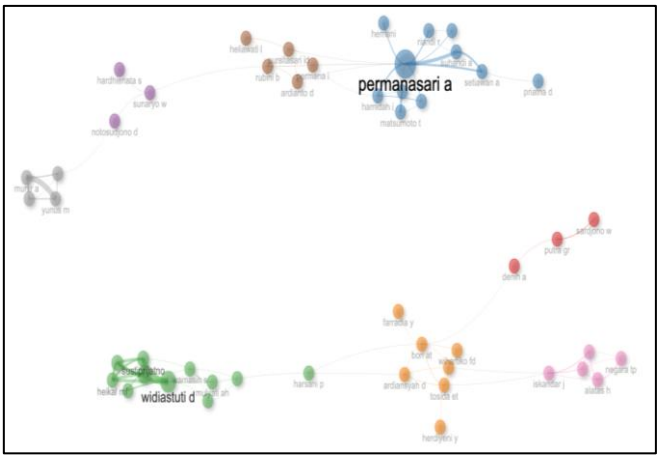

Fig. 10 Authors collaboration network

The contribution from the Faculty of Engineering (FT) reached 12%, while the Faculty of Economics and Business (FEB) reached 11%. Other faculties, including Faculty of Teacher Training and Education (FKIP) (7%), Vocational schools (SV) (6%), Faculty of Law (FH) (3%), and Faculty of Social Sciences and Humanities (FISIB) (2%), showed lower percentages, highlighting their relatively smaller role in research contributions. This distribution underlines the dominance of science and postgraduate faculties in research output at Pakuan.

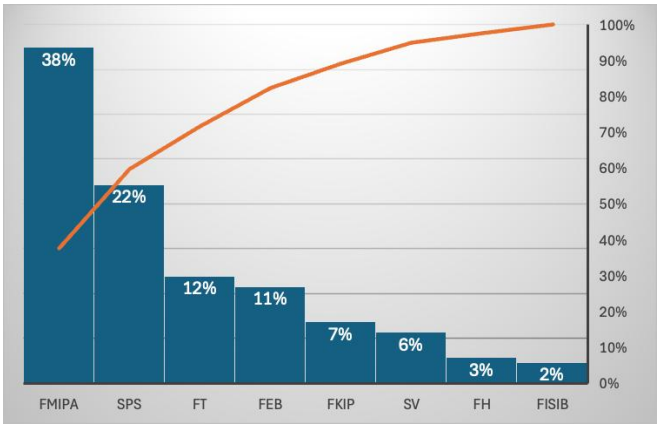

Fig. 11 Production of publications based on faculty homebase

F. Institution's Publication Collaboration

In relation to publication collaboration, it is known that Pakuan University has conducted many domestic collaborations, while overseas publication collaborations conducted with countries such as Japan, Malaysia, and China show a strong tendency towards international collaboration, with Japan publishing mainly in multi-country contexts (11 out of 12 publications), Malaysia focusing entirely on international research (11 multi-country publications), and China contributing mostly to collaborative studies (3 out of 4 publications). Meanwhile, collaborations with countries such as Hungary, UK, Australia, Brunei, Singapore, and Thailand show limited publication activity, with most of their publications being joint efforts, further highlighting the international orientation of their research efforts. The dominance of domestic collaboration is a concern, because considering the excellence status (akreditasi unggul) of Pakuan University, it should increase international collaboration.

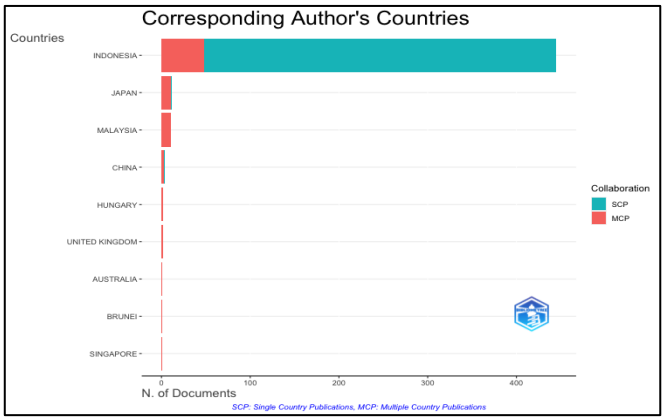

Fig. 12 Collaboration of Pakuan University based on author's country

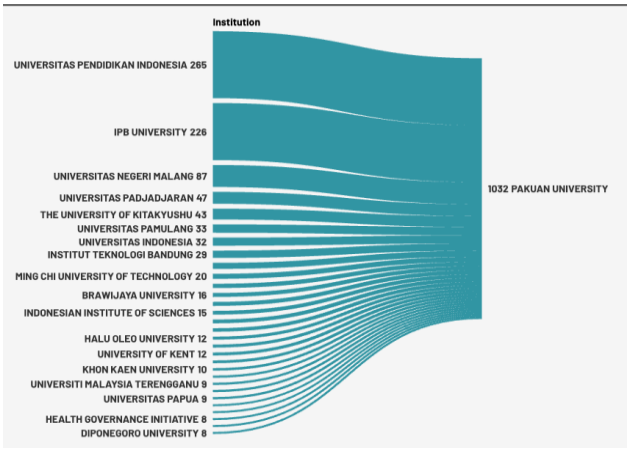

Fig. 13 Institution's Collaboration of Pakuan University publications

V. CONCLUSIONS

This study provides an overview of the growth and development of research output from Pakuan University, Indonesia, from 2010 to 2024. Scopus publications at Pakuan University are growing rapidly, with an annual growth rate of 32.7%, indicating a surge in research output. On average, each document was cited 3,867 times, indicating a moderate impact. A total of 1,780 authors contributed, with only 12 articles written by one person, highlighting the collaborative nature of the research. The largest distribution of Research Subjects is Engineering, followed by Physics and Astronomy, Environmental Sciences, social science, and computer science. The research topic trends since 2020 are in silico, sustainability, job satisfaction, and smart villages. Publication sources are dominated by conference proceedings and journals, including IOP Conference Series and AIP Conference Proceedings, The International Journal of Recent Technology and Engineering, and Journal of Engineering Science and Technology.

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The top 5 most prolific authors in orders are Anna Permanasari, Diana Widiastuti, Eneng Tita Tosida, Johan Iskandar dan Mochamad Yunus, while the most impactful are Anna Permanasari, Diana Widiastuti, Eneng Tita Tosida and Dolly Priatna. The Faculty of Mathematics and Natural Sciences (FMIPA) leads with the highest contribution, followed by the postgraduate school and the faculty of engineering, while the smallest are the faculties of law, social sciences, and humanities. Publication collaboration is dominated by Indonesian universities such as the Indonesian Education University and IPB University, while overseas collaborations include Japan, Malaysia, and China.

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