



Bibliometric analysis of Daluang: A citation analysis and visualization approach

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Abstract

Purpose. This study aims to examine the development of research using the keyword daluang by identifying: (a) article distribution, (b) citation analysis, and (c) research data visualization.

Methods. A bibliometric approach was employed a total of 118 articles were collected from Scopus, Google Scholar, Semantic Scholar, and Lens databases. Citation analysis was conducted using Publish or Perish, while VOSviewer was utilized to visualize authorship networks and keyword trends showing when specific topics were popular by year.

Findings. The findings indicate that articles using the keyword daluang were published between 2007 and 2024. Authorship patterns show an equal distribution between single-authored and collaborative articles, with 59 articles each. Most articles consist of 6–10 pages (43 articles). The most productive author is Yeni Budi Rachman, who published 5 articles with a total of 43 citations. The most productive publisher is UIN Walisongo Semarang through Daluang: Journal of Library and Information Science, which published 42 articles. The most influential article, based on citation counts, is the collaborative work by Aan Hasanah, Neng Gustini, and Dede Rohaniawati titled "Cultivating Character Education Based on Sundanese Culture Local Wisdom," which has been cited 70 times.

Implications. The bibliometric analysis of daluang-related publications from 2007 to 2024 reveals publication trends, authorship collaboration patterns, citation characteristics, and visual mapping of keywords and author networks. These findings provide valuable insights to support future research directions and foster scholarly collaboration in library and information science.

Keywords: Daluang; Bibliometric; Citation analysis; Visualization

1. Introduction

Daluwang is, "dalancang, dlancang, dilancang, dluwang, delwang, and jeluang." The idea that literacy elevates civilization is evident in the phrase *nimu malang tina daluang* (obtaining knowledge from daluang). Judging from this phrase, it is estimated that the word daluang comes from the Sundanese words *da malang* or *ja jasa* (*da* is a particle in Sundanese, and *ja* is a particle in Old Sundanese), and that *jaluwang* then changed to *jeluang*. This type of material is made from a tree known in West Java as the *saeh* tree, whose Latin name is *Broussonetia papyrifera* Vent. Other names for this tree in the

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archipelago are sepukau (Indonesia), glugu (Java), dha Lubang (Madura), kembala (Sumba), malak (Seram) (Setiawan Sabana & Hawe Setiawan, 2011).

Uli Kozok (2024) also states that daluang is paper made from the bark of *Broussonetia papyrifera*, which is known as saeh (Sundanese) or glugu (Javanese). Briefly, Emily Keppel (2019) stated that daluang is a typical Javanese mulberry bark paper, described as "a distinctive Javanese bark-paper," and is used for writing and bookbinding. Saeh trees reproduce by seeds and root shoots, and the soft parts can be processed into paper and clothing (Rachman, 2020).

Various collections of Daluang manuscripts can be found in libraries, museums, and private collections across Indonesia. The oldest known manuscript written in Daluang is the Javanese Islamic text *Boek van Bonang*, dating to the late sixteenth century. Daluang was also used as a medium for illustrating various episodes in *Wayang Beber*, a traditional Javanese scroll-painting art form originating in the late seventeenth century (Teijgeler, 1995).

Daluang, as a traditional writing medium in the 19th century, was instrumental in shaping Islamic scholarship in Java. When Islam arrived in Java, daluang was used to write manuscripts reflecting the concept of Islamic transformation, such as the Quran and hadith, as well as Sufistic works that were acculturated into Javanese mysticism. Islamic boarding schools, which replaced the "padepokan" system in the Hindu era, became centers of Islamic education and places where the culture of reading and writing developed. The use of daluang encouraged the development of calligraphy, illumination, and illustration, thereby making literacy in Arabic, Malay, and local languages more widespread. It was during this period that Islamic culture and Indonesian intellectualism reached their peak (Adisasmito, 2018). Daluang manuscripts contain knowledge, values, experiences, and practices accumulated over centuries, making them a crucial element of Indonesia's cultural heritage (Rachman, 2017).

With the increasing volume of scholarly publications, the daluang paper, as a historically significant writing medium, warrants preservation considering the importance of written historical values, and is worth studying. Content from ancient manuscripts on daluang and lontar paper serves as a valuable source for the research and writing of current researchers studying past cultures or history (Aisyah, 2021). For this reason, the author intends to search for articles containing the keyword daluang for further analysis using bibliometric methods.

Traditionally, a researcher's success is judged by the number of publications in peer-reviewed, indexed, and high-impact journals. The scholarly impact of a researcher is commonly assessed using various metrics (Agarwal, 2016). Bibliometrics is an interdisciplinary field that quantitatively examines scholarly communication through mathematical and statistical methods (Merigó et al., 2016). Bibliometrics is also a commonly used method for identifying the development of a particular field (Liao et al., 2018; Železnik et al., 2017). Bibliometric studies began to develop at the beginning of the 20th century. In 1917, Cole and Eales examined the development of scientific work in comparative anatomy through a bibliographic citation analysis (Osareh, 1996).

In 1969, British scientist Allen Richard first proposed the term "Bibliometrics" instead of "statistical bibliography". The emergence of this term marked the formalization of

bibliometrics; since then, an increasing number of researchers have become interested in this field. Furthermore, bibliometrics can be defined as the application of mathematics and statistical methods to books and other communication media (Pritchard, 1969). In other words, the use of statistical methods in the literature review process to explore research trends on a subject (Young & Belanger, 1983). In the last two decades, there has been tremendous growth in bibliometrics (Cappelletti-Montano et al., 2021). This method allows researchers to investigate abstracts, keywords, and research references in a particular field; uncover and compare authors, countries, journals, and institutions in the field; and pioneer scientific collaborations, researchers, and leading journals (Gumus, 2018).

Bibliometrics can also be expressed as a form of statistical analysis of publications that provides quantitative insight into academic literature (Benckendorff & Zehrer, 2013; De Bellis, 2009). Bibliometric analysis provides insight into the growth of the literature and the dissemination of knowledge in a particular field over time by analyzing information collected in a database, such as citations, authors, keywords, or cited sources (Van Raan, 2005). Bibliometrics includes methods such as citation analysis, co-citation, bibliographic coupling (De Bellis, 2009), and co-word analysis using keywords (He, 1999).

In contrast to other techniques, bibliometrics provides a more objective and reliable analysis (Aria, 2017). The sheer volume of new information, conceptual developments, and data is an environment where bibliometrics becomes useful by providing structured analysis of large amounts of information, inferring trends over time, researching themes, identifying shifts in disciplinary boundaries, detecting scientific and most productive institutions, and presenting the “big picture” of extant research (Crane, 1972).

Bibliometrics plays an important role in ranking the performance of researchers, research groups, institutions, or journals internationally. Individual researchers can use this information to advance their research and shape a career path that is more meaningful to them. In line with this opinion, Qutab (2022) states that bibliometric analysis is used to evaluate the research performance of individuals and institutions, assessing their productivity and impact in the scientific field. Bibliometric methods also help determine the contribution of their research to the direction of research at a particular institution, based on the institution's impact score. Bibliometrics is useful in hiring and promotion practices at universities, government institutions, and privately funded research laboratories. For researchers, bibliometrics helps select journals with the highest impact for publication. From a student's perspective, this helps them discover important articles and journals in a particular field, as well as identify influential researchers and articles. Research impact analysis is useful for tracking the development of a field and identifying the most cited works or researchers. Bibliometric methods also help researchers find potential collaborators or competitors. Impact indicators are also useful for assessing peer-review competence in a particular field.

Research performance is also an important factor in funding decisions, especially when decision-makers understand potential research trends and the relevance of emerging topics. Bibliometric information is used by funding bodies to determine which projects have the potential to deliver the best results and to allocate limited funds. Governments and related officials also use this data in strategic planning and to inform the public about

the latest research (Agarwal, 2016). The main benefit of bibliometrics is that it supports researchers studying specific research areas by analyzing citations, co-citations, geographic distribution, and word frequency, thereby yielding significant findings. Until now, bibliometrics has been widely applied in research on current issues (Yeung et al., 2017), analysis of author collaboration (Sweileh et al., 2016), co-citation analysis (Merigó et al., 2017), as well as mapping the development of the field of science as a whole (Merigó & Yang, 2017).

The focus of bibliometric research is on several broad subjects or is more specialized in publishing patterns that include geographical aspects (Lin, 2012; Zhuang et al., 2013) or institutional, and performance indicators include developments over a certain period (Huffman et al., 2013), subject domain or discipline (Dalpé, 2002; Liu et al., 2012; Zibareva et al., 2014) or types of literature and authorship (White & McCain, 1998). The analysis covers a wide range of material categories, from journal articles, books, theses, and patents to within-category reports of grey literature (Ellegaard & Wallin, 2015).

Today, bibliometrics refers to the quantitative analysis of publication data, using elements such as documents, authors, or sources (e.g., journals), to reveal characteristics, patterns, and relationships that demonstrate the productivity, quality, or impact of individual researchers or research teams. Scientific publication metadata is used to describe the characteristics and content of a work, from the creation process to its dissemination, and for certain databases, including its reach and impact after publication. The publication data elements recorded for work vary across bibliographic databases and can be more detailed for certain types of publications, such as peer-reviewed journal articles, or for certain scientific disciplines. Most bibliographic databases allow searching and retrieving publication data. At the same time, some provide tools for creating visualizations and citation maps, as well as the ability to export such data for further analysis. Publication data metrics encompass various research and scientific activities and can serve as a useful tool for demonstrating an academic's productivity and the impact of their published work. Historically, the impact or influence of a scientific work is recognized through citation of the publication in subsequent scientific works. The benefits of quantitative analysis of publication data for revealing characteristics, patterns, and relationships that demonstrate productivity or impact have been described in various academic and scientific settings. Publication data can be used to uncover various narratives that provide a meaningful picture of scientific productivity and impact. These narratives can be used for various purposes, such as promotion/placement, grant applications and renewals, benchmarking, recruitment efforts, and administrative needs, including institutional or university performance reports (Carpenter et al., 2014).

Several studies have explored traditional paper materials in various contexts. Daluang, a traditional bark paper, has a long history in the cultural and literacy practices of the Nusantara region. However, research on daluang remains limited, particularly in bibliometric and citation analyses. While bibliometric studies are commonly applied in the fields of science and technology, their application in cultural studies and philology remains underdeveloped.

Prameswari et al. (2024) conducted a bibliometric analysis using the Scopus database to examine research trends on the preservation of ancient manuscripts in libraries. The

study mapped the development of manuscript preservation research from 2014 to 2023 into three main clusters: manuscript, historic preservation, and digitization.

Similarly, Hidayat et al. (2023) conducted a bibliometric study to investigate research trends on the digital preservation of ancient manuscripts in libraries. The study revealed that research on digital preservation of ancient library manuscripts remains scarce, with only 52 publications in the last decade (2012–2022). The study concluded that librarians should play a more active role in informing researchers about this issue to encourage further exploration of digital manuscript preservation in libraries.

Rachman (2018) provided a historical overview of the production and use of daluang and identified the degradation phenomena affecting daluang manuscripts in the Cirebon community. Through literature review, interviews, and surveys examining daluang manuscripts, the study documented the current condition of these manuscripts in Cirebon. The findings highlighted that daluang is a durable writing material with a pH level of 7–8. Regarding preservation strategies, the study emphasized that manuscript owners should improve storage conditions to ensure long-term preservation. To minimize the risk of mold growth, the study recommended routine dry cleaning of manuscripts, using appropriate storage materials, wrapping manuscripts in acid-free paper, maintaining a clean storage environment, handling manuscripts with gloves, and carefully turning pages to prevent further deterioration.

Previous studies have not specifically examined research trends on daluang using bibliometric analysis to assess how this topic has evolved in the academic literature. Therefore, this study aims to explore publication trends, citation patterns, and academic collaboration in Daluang research using data from Scopus, Google Scholar, Semantic Scholar, and Lens databases, covering the period from 2007 to 2024. This analysis is expected to identify major contributions, interconnections among research, and gaps in the literature.

2. Methods

This research employs bibliometric methods, focusing on articles indexed by the keyword daluang, to analyze article distribution, authorship, citations, and article visualization. Bibliometrics is a measurable method in informatics (Alhashmi et al., 2023). It is often used to identify top journals and authors in a field, assess research progress (Wang et al., 2020), and predict research trends (Ho, 2020). Bibliometric methods use statistical and mathematical techniques to analyze publication patterns in articles and journals on specific topics (Damanik et al., 2024).

Data collection was carried out through the Scopus and Google Scholar databases via Publish or Perish, Semantic Scholar, and Lens on December 2, 2024. This research uses several data sources to expand the dataset, each with its own scope. As for the following *database* used by the author: (1) Scopus is an academic database developed by Elsevier, which is paid, and covers various scientific fields. Scopus offers various search features, such as quick search, advanced search, and author or source search. This database indexes articles from 1966 onward, with citation analysis available for articles published after 1996. Scopus allows searches restricted by publication date, document type, or subject area.

Search results can be exported, printed, or sent via email. Apart from that, Scopus provides citation analysis in the form of a table showing the number of citations per year, and cited articles can be accessed directly by clicking the citation count. Another advantage is that search tips are available in various languages. However, access to Scopus requires a subscription fee (Falagas et al., 2008).

(2) Google Scholar is a free academic search engine developed by Google Inc. This database is designed to reach a wide audience, with no language or keyword limits. Google Scholar does not provide a specific list of indexed journals and includes all electronically available publications. Although it supports quick and advanced searches (e.g., by title, author, source, or publication date), Google Scholar does not directly display information about abstract or full-text availability. Found articles list the number of citations, which can be accessed by clicking on the corresponding link. Google Scholar also allows users to find related articles or perform further web searches via Google (Falagas et al., 2008). (3) The Lens is a *platform* that provides integrated access to more than 272 million scientific papers, 155 million global patents, and 495 million genetic code patents. Developed by Cambia, The Lens supports cross-disciplinary exploration, analysis, and knowledge management with features such as citation analysis, genetic code search (PatSeq), and document collection tracking. The platform integrates a variety of open data sources, including PubMed, CrossRef, and ORCID, making it an essential tool for bibliometric research, technological innovation, and data-driven decision-making (The Lens, n.d.). (4) Semantic Scholar provides free artificial intelligence (AI)-based search tools, as well as open resources to the worldwide research community. The platform indexes more than 200 million scientific papers obtained in collaboration with publishers, data providers, and web searches (The Allen Institute for Artificial Intelligence, n.d.).

The following are the search criteria for articles with the keyword Daluang:

Table 1. Data Selection Process

Criteria	Description
Keywords	Daluang
Year	Not limited
Database	Scopus, Google Scholar, Semantic Scholar, Lens
Inclusion Criteria	Journal related to the keyword daluang Journal with open access status The publication type is an article Uses Indonesian and English
Exclusion Criteria	The journal is not related to the keyword daluang Journal with closed access status The publication type is not an article Use other languages other than Indonesian and English

Source: Results processed by researchers, 2024

Based on the search results obtained, the data is saved in RIS format. The data was then exported to the Mendeley application to review compliance with the inclusion criteria above and complete the article metadata. This study used 118 metadata items, comprising

42 from articles in the journal Daluang and 76 from traditional papers that discuss Daluang as a research subject. This distinction shows that data are identified not only by journal name but also by their relevance to the discussion, helping ensure the validity and accuracy of the bibliometric analysis.

The following is the data selection process carried out by the author:

Table 2. Research Data Selection

Information	Amount	Percentage
Overall data	236	
Duplicate Data	81	34.32
Book	4	1.69
Book chapter	6	2.54
Conference Proceeding	18	7.63
Thesis	1	0.42
Research report	2	0.85
Languages other than Indonesian and English (Chinese, Croatian)	4	1.69
Audiovisual	1	0.42
Book review	1	0.42
Metadata for analysis is incomplete	2	0.85
Data used	118	50.00

Source: Researcher processed results, 2025

After obtaining the data, the next step is to perform further analysis in Microsoft Excel to rank and process it. For citation analysis, the Publish or Perish application is used, while author and keyword visualization is obtained using the Vosviewer application.

VOSviewer is software designed to map research data networks, allowing researchers to visualize and explore patterns and relationships in the data (Van Eck N & Waltman L, 2019). VOSviewer collects a term co-occurrence matrix, thereby enabling the visualization of research trends (Pinto, 2020). Vosviewer can visualize trending topics in samples, along with the connections among them. In addition, VosViewer can differentiate topics for each year using colored dots, so the relevance of sample keywords can be identified as they appear (Mubarrok et al., 2022).

Descriptive analysis is used to evaluate the productivity of authors, journals, and keywords related to the discussion theme, namely the keyword daluang. The keywords used in the article can accurately explain the topic discussed. Therefore, analyzing keyword networks can reveal connections between the topics discussed in the article (Jana, 2024).

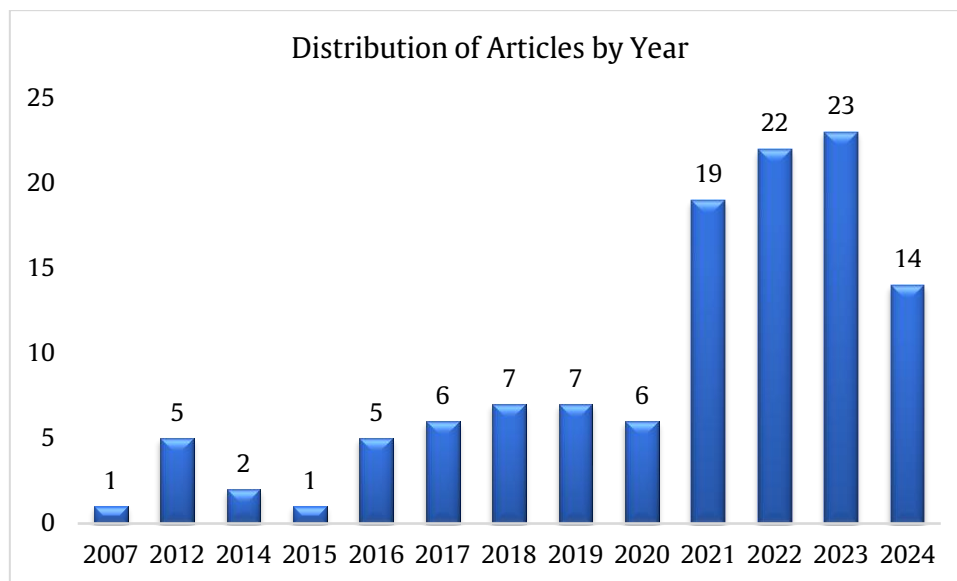
3. Results and Discussion

3.1 Article Distribution

3.1.1 Distribution of Articles by Year

The number of Daluang-themed articles in the Scopus, Google Scholar, Semantic Scholar, and Lens databases is shown in Graph 1. Search results for the keyword Daluang

in the *database*. It is known that there are 2007-2024 periods with a total of 118 articles. During 2007-2013, publications on daluang were not always available. However, during 2014-2024, the number of articles containing the keyword daluang fluctuated.



Graph 1. Number of Publications of Articles "Daluang" 2007-2024
Source: Researcher Processed Results, 2025

3.1.2 Article Distribution Based on Authorship

Based on Table 3, the number of individual and collaborative authors is comparable, namely 59 articles (50%) of the 118 articles used as research samples. The highest number of collaborations occurred in 2023, namely 17 articles.

Table 3. Distribution of articles based on the number of authors

Year	1	2	3	4	5	6	Total
2007	1						1
2012	5						5
2014	2						2
2015		1					1
2016	3	1	1				5
2017	5	1					6
2018	5	1	1				7
2019	6		1				7
2020	4	2					6
2021	10	6	2	1			19
2022	10	8	2	1	1		22
2023	6	8	7	1	1		23
2024	2	4	2	5		1	14
Amount	59	32	16	8	2	1	118

Source: Results Processed by Researchers, 2025

3.1.3 Distribution of the number of pages

In Table 4, it can be seen that the percentage of articles with a page length of 6-10 pages is the highest (43 articles / 36.44%).

Table 4. Distribution of articles based on the number of authors

Years	Number of pages								Total
	1-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	
2007	0	0	0	1	0	0	0	0	1
2012	0	1	0	2	2	0	0	0	5
2014	0	1	1	0	0	0	0	0	2
2015	0	1	0	0	0	0	0	0	1
2016	1	0	0	0	2	1	1	0	5
2017	0	2	1	2	1	0	0	0	6
2018	0	3	2	1	1	0	0	0	7
2019	0	2	1	1	2	1	0	0	7
2020	0	2	0	3	0	1	0	0	6
2021	0	11	7	1	0	0	0	0	19
2022	0	6	11	2	0	1	1	1	22
2023	1	10	7	1	0	3	1	0	23
2024	0	4	6	2	1	0	0	1	14
Total	2	43	36	16	9	7	3	2	118

Source: Results Processed by Researchers, 2025

3.1.4 The most prolific writer

To identify the development of a scientific field, one can measure the most productive authors. What is meant by a productive author is an individual who publishes high-quality work in a particular field (Ritonga & Purwaningtyas, 2024). Based on Table 5, Yeni Budi Rachman is the most productive author on the subject of daluang, according to the research sample database. It is known that 5 documents have been published, either individually or in collaboration with other authors.

Table 5. List of Prolific Authors

No	Name	Number of Articles	Citation
1	Yeni Budi Rachman	5	43
2	Majid Daneshgar	3	27
3	Tamara Adriani Salim	3	14
4	Heriyanto, Heriyanto	3	3
5	Sedek Ariffin	3	1
6	Siti Azwanie Che Omar	3	1
7	Tedi Permadi	3	0
8	Tati Rahmayani	2	21
9	Muh Ahlis Ahwan	2	5
10	Tupan, Tupan	2	2
11	Ramadani Ningsih Maha	2	1
12	Elis Suryani NS	2	1
13	Harcaryo, Pramudibyanto	2	1

Continued Table 5...			
14	Roni Rhodin	2	1

Source: Results Processed by Researchers, 2025

3.1.5 Most Prolific Publisher

The following are several institutions that publish articles containing the keyword "daluang". Of the 118 articles sampled in this research, 53 publishing institutions were involved. The publisher that publishes the most articles with the keyword daluang is UIN Walisongo Semarang. Based on the author's subsequent analysis, many publishers publish articles with the keyword daluang because of the journal's name. Based on the database search results, the data that appears is a scientific work containing the word daluang throughout the document. For this reason, in this research, the appearance of the word daluang, whether listed in the contents of the document or identity, or in this case, the name of the journal, will be analyzed further in the discussion.

Table 6. List of Prolific Publishers

No	Publisher	Number of Articles	Number of Citations
1	UIN Walisongo, Semarang, Indonesia	42	63
2	National Library of the Republic of Indonesia	7	8
3	Taylor & Francis	5	34
4	Ministry of Religion of the Republic of Indonesia	5	3
5	The Gruyter Saur	3	38
6	UIN Imam Bonjol Padang	3	3
7	Indonesian University of Education (UPI)	3	3
8	UIN Sunan Gunung Djati Bandung	2	70
9	Association for Al-Qur'an & Tafsir Science in Indonesia	2	21
10	Indonesian Art Institute Denpasar	2	10
11	Brill	2	9
12	Nusantara Manuscript Society (MANASSA)	2	2

Source: Results Processed by Researchers, 2025

3.1.6 Most Relevant Journals

Based on the 118 articles analyzed in this research, 60 journals publish articles containing the keyword "daluang". The journal that publishes the most articles with the keyword Daluang is the Daluang Journal: *Journal of Library and Information Science*. Table 7 shows the 10 journals that contain the most articles with the keyword "daluang". Some of these journals cover philology and manuscripts, religion, arts and culture, libraries, and archives.

Table 7. Most Relevant Journals

No	Journal	Number of Articles	Citation
1	Daluang: <i>Journal of Library and Information Science</i>	42	63
2	Jumantara: Journal Manuskrip Nusantara	7	8
3	<i>Indonesia and the Malay World</i>	3	28
4	Jurnal Lektur Keagamaan	3	1
5	Nun: Jurnal Studi Alquran dan Tafsir	2	21
6	Restaurator	2	16
7	Mudra Jurnal Seni Budaya	2	10
8	Library Philosophy and Practice	2	2
9	Majalah Ilmiah Tabuah: Ta'limat, Budaya, Agama dan Humaniora	2	2
10	Penamas	2	2
11	Manuskripta	2	2

Source: Results Processed by Researchers, 2025

3.1.7 The most influential article

The influence of research can be identified through citation analysis, which shows how much the author has contributed to the field of science (Sánchez-Roldán et al., 2022). Based on data from this research, the most-cited article on the keyword daluang was the work of Hasanah, Gustini, and Rohaniawati (2016), with 70 citations, entitled "Cultivating Character Education Based on Sundanese Culture Local Wisdom."

Table 8. Authors with the Most Cited Documents

No	Writer	Number of Documents	Number of Citations
1	Aan Hasanah, Neng Gustini, Dede Rohaniawati	1	70
2	Yeni Budi Rachman	5	43
3	Tamara Adriani Salim	3	14
4	Majid Daneshgar	3	27
5	Agus Suherman	1	37
6	Tati Rahmayani	2	21
7	Ahmad Kusuma Wardhana, Ririn Tri Ratnasari	1	14
8	Oman Fathurrahman	1	10
9	Roger Tol	1	10
10	Dian Puspitasari	1	9

Source: Results Processed by Researchers, 2025

Table 9. Authors with the Most Cited

Cites	Authors	Title	Year	Source	Publisher
70	Aan Hasanah, Neng Gustini, Dede Rohaniawati	Cultivating Character Education Based on Sundanese Culture Local Wisdom	2016	Jurnal Pendidikan Islam	UIN Sunan Gunung Djati Bandung

Continued Table 9...

37	Agus Suherman	Literacy Tradition of Sundanese Society - Indonesia: an Annotation of the 16th Century Ancient Manuscript	2019	International Journal for Innovation Education and Research	International Educative Research Foundation and Publisher
22	Yeni Budi Rachman	the Use of Traditional Conservation Methods in the Preservation of Ancient Manuscripts: A Case Study from Indonesia	2017	Preservation Digital Technology and Culture	De Gruyter
19	Tati Rahmayani	Karakteristik Manuskrip Mushaf H. Abdul Ghaffar di Madura	2019	Nun: Jurnal Studi Alquran dan Tafsir di Nusantara	Asosiasi Ilmu Al-Qur'an & Tafsir se-Indonesia
14	Majid Daneshgar	A Very Old Malay Islamic Manuscript: Carbon Dating and Further Analysis of A Persian-Malay Anthology	2022	Indonesia and the Malay World	Taylor & Francis
14	Akhmad Kusuma Wardhana, Ririn Tri Ratnasari	Analisis Sitasi Publikasi Tentang Repositori Bidang Studi Perpustakaan pada Web of Science Selama Pandemi	2022	Daluang: Journal of Library and Information Science	UIN Walisongo
10	Roger Tol	The Wonderful UNESCO Collection of Panji Tales in Leiden University Libraries	2019	Wacana Journal of the Humanities of Indonesia	Universitas Indonesia
10	Oman Fathurahman	A New Light on the Sufi Network of Mindanao (Philippines): the Sheikh Muhammad Said Manuscript Collection	2019	Indonesia and the Malay World	Taylor & Francis
9	Majid Daneshgar	An Old Persian-Malay Anthology of Poems From Aceh	2020	Dabir	Brill
8	Yeni Budi Rachman, Tamara Adriani Salim	Daluang Manuscripts From Cirebon, Indonesia: History, Manufacture and Deterioration Phenomena	2018	Restaurator	De Gruyter Saur
8	Asti Hakeni Harken	Aksara Incung sebagai Inspirasi Motif Batik Masyarakat Kerinci	2021	Jurnal Khazanah Intelektual	Badan Penelitian dan Pengembangan Daerah Provinsi Jambi
8	Yeni Budi Rachman	Palm Leaf Manuscripts From Royal Surakarta, Indonesia: Deterioration Phenomena and Care Practices	2018	Restaurator	De Gruyter Saur

Source: Results Processed by Researchers, 2025

3.2 Citation Analysis

Citation Metric Analysis Using Harzing Publish or Perish (PoP)

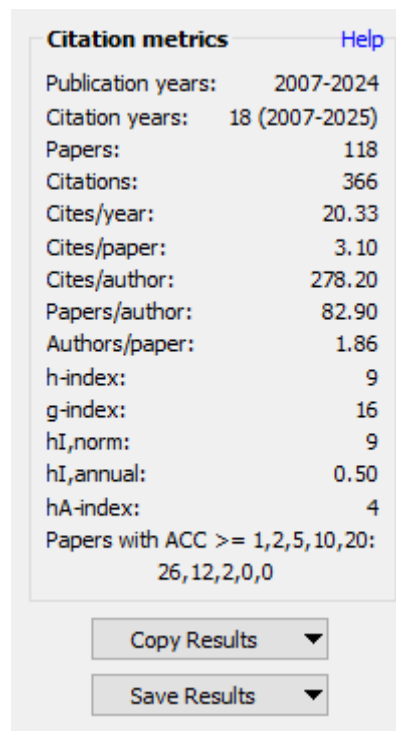


Figure 1. Publish or Perish Citation Metrics
Source: Results processed by researchers (2025)

Analysis results from the software *Publish or Perish* show various citation metric indicators that are important for evaluating scientific performance based on available data. The following is an explanation of the main metrics (David Adams, 2016):

Table 10. Citation Metrics of Publications

No	Citation Matrics	Description
1	Publication Year (Publication Years)	The data show publication years ranging from 2007 to 2024, indicating the period covered by the research analyzed.
2	Citation Years (Citation Years)	The number of years from the first publication (2007) to the evaluation year (2025) is 18 years.
3	Number of Documents (Papers)	There were 118 documents analyzed, including journal publications, conference proceedings, and other materials.
4	Total Citations (Citations)	The total citations received were 366, averaging 20.33 citations per year.
5	Citations per Document (Cites/Paper)	The average number of citations per document is 3.10.
6	Citations per Author (Cites/Author)	The average number of citations per author is 278.20, calculated by accounting for each author's contribution to individual publications. This figure represents the average citation count attributed to each author.

Continued Table 10...

7	Documents per Author (Papers/Author)	The average number of documents produced per author is 82.90. These results show the average number of documents written by an author in the dataset.
8	Authors per Document (Authors/Paper)	The average number of authors per document is 1.86. These results are obtained from the total number of authors of all documents divided by the number of documents
9	h-index (h-index)	The Hirsch index (h-index) is 9, indicating 9 documents each with at least 9 citations.
10	G index (g-index)	The g-index is 16, giving more weight to publications with more citations.
11	Normalized Individual h Index (hI, norm)	The hI norm value of 9 reflects the influence of citations per author after accounting for co-authors' contributions.
12	hI Annual (hI, annual)	This value is 0.50, which represents the average annual increase in an individual's h-index.
13	hA index (hA-index)	This index shows the average annual citations for an author's documents, with an hA value of 4.
14	Articles with ACC $\geq 1, 2, 5, 10, 20$: 26,12,2,0,0	ACC $\geq 1, 2, 5, 10, 20$ is a measure of how often documents are referred to each year.

Of the 26 documents that were referenced at least once per year, 12 were referenced more frequently, with at least 2 citations per year, while only 2 documents received an average of at least 5 citations per year. No document achieved an average of 10 or 20 citations per year.

With these metrics, it is possible to determine authors' productivity, collaboration patterns, and the long-term impact and relevance of research. The use of various indices, such as the h-index, g-index, and ACC, provides a broader view of the performance of a researcher or research group.

3.3 Visualization

3.3.1 Visualization of Collaborative Authorship

In this research, it is known that during the period 2007-2024, a total of 219 authors had works with the keyword daluang; in other words, there were contributions from 195 authors, as each author could publish several articles. The following is a visualization of 151 author items showing author collaboration on publications with the keyword "daluang". The authors selected the following visualization based on a collection of authors who published more than one document and those with collaborations. In comparison, individual authors who published one document were not included. These selection criteria emphasize collaboration patterns among authors.

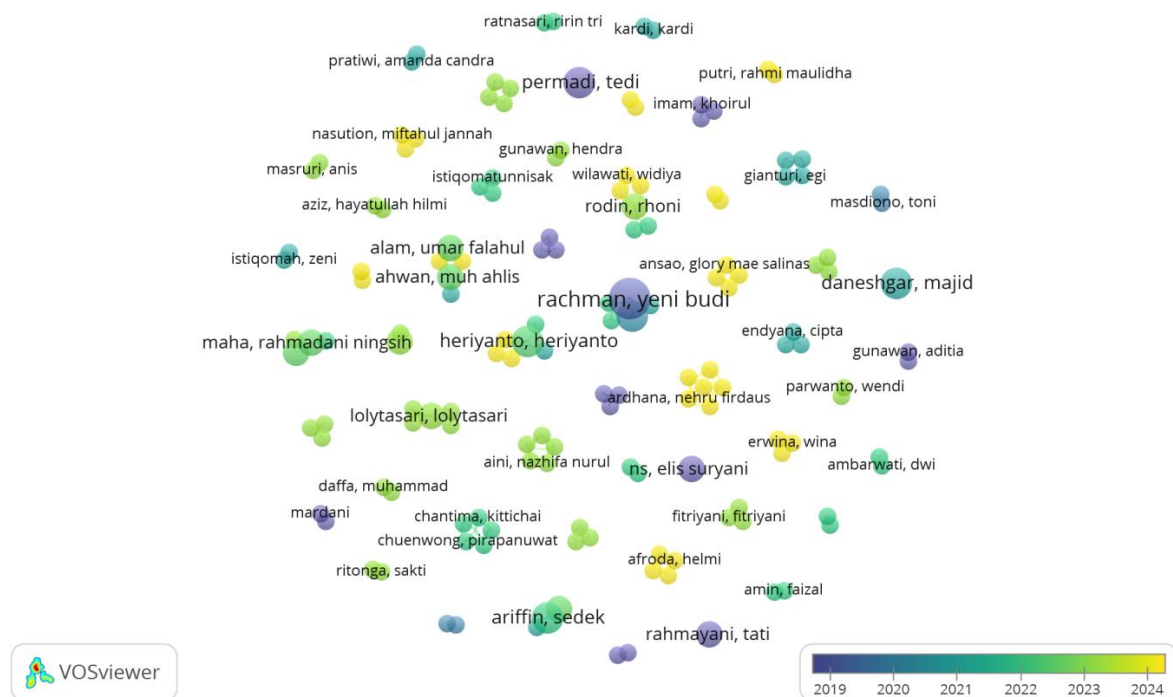


Figure 2. Visualization of Author Collaboration
Source: Results Processed by Researchers (2025)

Each node in the visualization represents the author of a publication with the keyword "daluang". The size of the nodes in the network indicates the frequency of an author's involvement: the larger the node, the more often the author is involved in publications. Meanwhile, the visualization shows the publication year for 2019-2024, the most recent period. *Up to date*, as stated in the legend at the bottom of the figure. Furthermore, the line connecting two nodes indicates collaboration between authors. The length of the line shows the strength of the relationship/number of collaborations between authors.

The visualization above shows that there are 53 distinct groups (clusters), characterized by groups of adjacent nodes. Each cluster represents a sub-network of authors who collaborate more frequently than authors in other clusters.

Authors such as "Rachman, Yeni Budi," "Heriyanto, Heriyanto," and "Daneshgar, Majid" have large nodes and are at the center of the network, indicating they have made significant contributions or frequently collaborate on this topic. Of the total of 219 authors identified, 195 unique authors have contributed, in the sense that some of them have more than one publication, or it could be said that some authors have contributed to more than one publication. The total number of links between authors is 160, with a total strength of 163, indicating a fairly strong collaborative relationship on this topic.

This visualization shows that research on the keyword "daluang" has a gradually developing collaboration network, with several key figures facilitating collaboration and knowledge dissemination. Different clusters indicate a particular focus within a subtopic, while color variations reflect the growth of research activity in recent years.

3.3.2 Visualization *Co-occurrence Author Keyword*

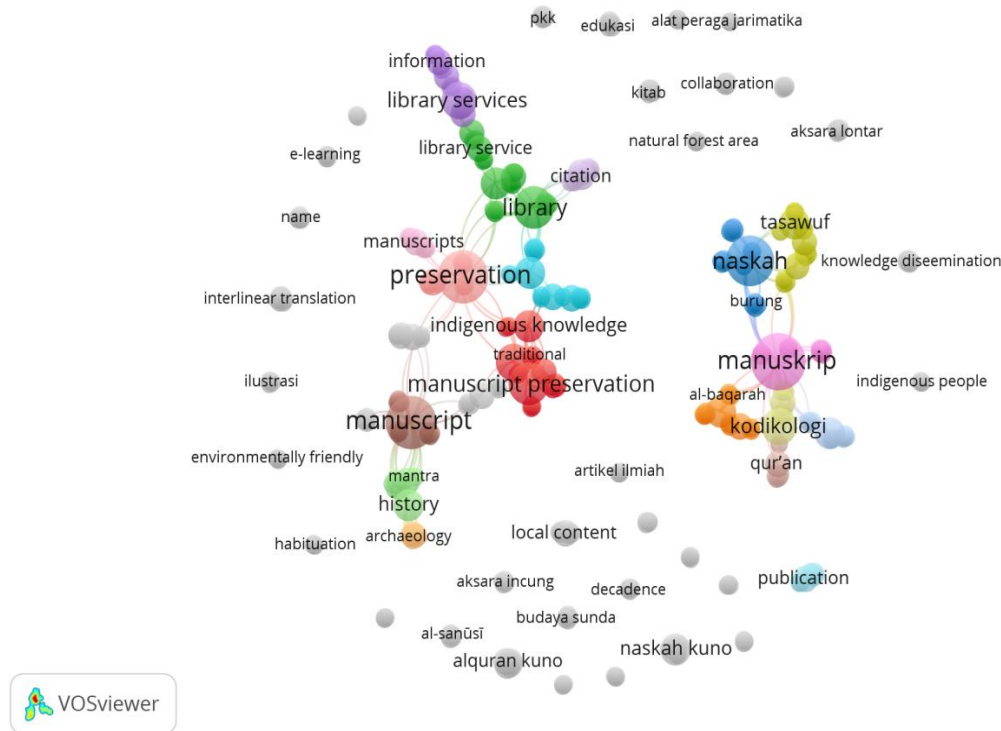


Figure 3. Visualization *Co-occurrence*
Source: Results Processed by Researchers (2025)

Keywords are very important because they indicate the focus of a field of study (Madali-Kafes, 2024). Publication trends based on keyword occurrences involve analyzing the frequency and patterns of keyword usage in published articles. This analysis provides insight into emerging research areas, popular themes, and changes in research trends over time (Hou, 2018).

Publication trends based on keyword occurrences involve analyzing the frequency and patterns of keyword usage in published articles. This analysis provides insight into developing research areas, popular themes, and changes in research priorities over time. This bibliometric analysis focuses on the keyword *daluang*. The resulting visualization in VOSviewer maps the relationships among research keywords related to "manuscripts" and "preservation" in the context of culture, history, and traditional knowledge. This visualization consists of 379 items divided into 54 item clusters. Each cluster represents a theme or group of interrelated keywords. The total number of links connecting keywords is 897, with a total relationship strength of (*total link strength*) of 915, indicating the intensity of the relationship between keywords. Keywords such as preservation, manuscript preservation, and library services occupy a central position in this network, underscoring the importance of manuscript conservation in the literature. Manuscripts in Indonesian (such as "naskah" and "manuskrip") cluster closely with local themes, including codicology, indigenous knowledge, and Sufism.

In this visualization, some clusters group themes, which are marked with specific colors—for example, red indicates manuscript preservation and traditional knowledge. The colors blue and yellow are associated with ancient texts, codicology, philology, and cultural aspects such as Sufism and the ancient Koran. The color green is associated with library services and information management.

The visualization also shows how different themes, such as preservation, traditional knowledge, and ancient manuscripts, are interrelated and support interdisciplinary studies, including history, local culture, and the study of religious texts. This visualization shows that research on manuscript themes focuses not only on the technical aspects of conservation but also on the social, cultural, and spiritual context of the material studied.

This study identifies significant keywords, including manuscripts, preservation, libraries, and history. These terms evolve the research landscape in the study of Daluang. The identified cluster serves as a foundational reference for future research, providing a structured approach for examining various research on Daluang. Through bibliometric analysis, researchers can use these clusters to gain insights into evolving trends and patterns in the field, guide the direction of their investigation, and contribute to advancing knowledge in this field.

Based on the h-index information, affiliation, author, publisher, and visualization of the Daluang article described in this paper, this finding can serve as a valuable reference for further research. By conducting a more in-depth analysis, researchers can gain deeper insights into patterns and trends in the study. This comprehensive understanding can contribute significantly to advancing knowledge in the scope of the study and its implications.

The authors have identified the top 10 researchers with the highest total number of citations from data extracted from several databases, namely Scopus, Google Scholar, The Lens, and Semantic Scholar. These researchers can function as valuable references for future research efforts. By exploring their contributions, scholars can gain insights into the most influential works and trends in the field, guide their investigations, and enrich the discourse on this problem. Thematic evolution of trends in the themed publication indexed by the database, without a specific year, reveals that each year sees the emergence of distinct keyword usage patterns among researchers.

The VosViewer application, which facilitates bibliometric analysis, further illustrates this trend by assigning different colors to each year. This comprehensive approach highlights the dynamic nature of research interests and offers valuable insights into landscapes that emerge from the thematic study. By identifying this trend, scholars can better understand the priorities and focus areas that shift within the field, thereby informing their research agendas and advancing knowledge about exploitation. Daluang, as a medium for recording the history of civilization, can be studied from various perspectives, including content, history, preservation, philology, and literature. Daluang is used as a medium for writing manuscripts on tauhid, nahwu, sharaf, and mantiq at the History Museum of the Koran of North Sumatra (Miftahul Jannah Nasution et al., 2024). The manuscript made from Daluang is also found in Java, written in the Pegon script, with a hollow condition and shrinkage at the top and bottom (Widuri, 2016). In addition, Paper Daluang can be used as a medium for artwork, especially in visual communication design

(Meyrina, 2012). Not only that, but Daluang paper is also used as a substitute for Canva media, using certain painting techniques and experiments with paint made from natural materials, namely suji and pandanus leaf extract (Listiani & Rohandi, 2015). As scientific treasures, manuscripts contain various forms of information, with levels of authenticity, originality, and validity that can be accounted for.

The information in question is related to history, both the writing of the text itself and the history that surrounds the writing of the text. In addition, the manuscript discusses the scientific history of the period in which the text was written. Other information is the teaching delivered by a text. With it, we can see the transmission and scientific transformation flow itself. Finally, no less important is sanad, scientific genealogy, with which a researcher can trace the author's knowledge to the root of scientific origin. In addition, with the sanad, we also look at the ornamental of science taught and transmitted to the next generation (Hasan, M. Tholhah, 2004).

Bibliometric summary analysis conducted using a Vosviewer can function as a valuable foundation for further research, offering insights that can lead to innovative discoveries. By revealing new patterns, trends, and relationships among related topics, researchers can deepen their understanding of the subject and explore previously unexplored areas. As a result, this summary provides a comprehensive review of existing research and catalyzes deeper exploration of a novel framework and fresh ideas.

4 Conclusion

In this research, articles with the keyword daluang were published starting in 2007, with significant growth in 2023. For authorship patterns, the number of articles written individually and collaboratively was comparable, at 59 each. Furthermore, a total of 43 articles were written, each 6-10 pages long. The most productive writer who wrote articles using the keyword daluang was Yeni Budi Rachman, with 5 documents receiving 43 citations. The most productive publisher for articles with the keyword daluang is UIN Walisongo Semarang, in the journal *Daluang: Journal of Library and Information Science*, with a total of 42 articles. The most influential article, or in this case, the most cited, is the collaborative work by Aan Hasanah, Neng Gustini, and Dede Rohaniawati titled "Cultivating Character Education Based on Sundanese Culture Local Wisdom," which has a total of 70 citations. The results of the citation analysis, along with the visualization of articles that work with the keyword daluang, were obtained from the Publish or Perish and Vosviewer applications. The results of this study recommend that researchers publish Daluang's findings in the journals *Preservation*, *Digital Technology and Culture*, and *Indonesia and the Malay World*. This study further suggests under-researched topics, such as local content and knowledge dissemination.

5 Acknowledgment

5.1 Declaration of Generative AI Use

In preparing this manuscript, the authors used generative AI and AI-assisted tools, specifically WriteHuman and Grammarly, solely to improve grammar, language, and readability by humanizing AI-generated sentences. These tools were not used to create or falsify data, conduct analyses, or interpret results. In compliance with Daluang's Generative AI Policies, which state that AI tools cannot be listed as authors and disclosure is required, the authors have thoroughly reviewed, validated, and edited all AI-assisted outputs and take full responsibility for the accuracy, validity, and originality of the work.

5.2 Author Contributions

Authorship is limited to those who have made significant contributions in accordance with Daluang's Authorship Criteria (conception, design, execution, or interpretation of the study; drafting or critical revision; and final approval). Author 1: Made substantial contributions to the conception of ideas, provided critical intellectual content, and gave final approval of the version to be published and agreed to its submission. Author 2: Contributed to data acquisition, data processing, and analysis, drafted and composed the entire scientific article from inception to completion, and has seen and approved the final version.

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