Berkala Ilmu Perpustakaan dan Informasi, Vol. 20, No. 1, Juni 2024, Hal. 163-176
https://doi.org/10.22146/bip.v19i1.8272
ISSN 1693-7740 (Print), ISSN 2477-0361 (Online)
Tersedia online di https://journal.ugm.ac.id/v3/BIP

Author productivity analysis in Q1 of authors in journal library and information science Q1 journals using with Lotka's Law

Nasya Meilia Pratiwi[1], Cecep Ibrahim[2], Nisya Ula Alkarimah[1], Zalika Naila Arifah[1], Thufailah Hamida Jatmik[1], Afini Mutiara[1], Amelia Fatimah Azzahra[1], Sherin Wiryani Putri[1], Danang Dwijo Kangko[1], Rina Astarika[3], Jopang[4]
[1]Department of Library and Information Science, Faculty of Information Technology, YARSI University
[2]Department of Library and Information Science, Faculty of Social and Political Sciences, Halu Oleo University
[3]Department of Agribussiness, Faculty of Science and Technology, Universitas Terbuka
[4]Department of Public Administration, Faculty of Social and Political Sciences, Halu Oleo University
[1]Jl. Letjen Suprapto, Central Jakarta, Special Capital Region of Jakarta, 10510
[2,4]Jl. Kampus Hijau Bumi Tridharma, Anduonohu, Kendari City, 93232
[3]Jl. A.H. Nasution, Kelurahan Kambu Bundaran Anduonohu, Kambu, Kec. Kendari, Kota Kendari, Sulawesi Tenggara 93232
e-mail: cecep.ibrahim@uho.ac.id

Submitted: May 24, 2023, Revised: February 26, 2024, Accepted: April 19, 2024

ABSTRAK

Pendahuluan. Penelitian ini bertujuan untuk mengetahui pola produktivitas pengarang pada Jurnal Ilmu Perpustakaan dan Informasi Q1 Scopus dengan menggunakan pengujian hukum Lotka.
Metode penelitian. Penelitian ini menggunakan metode deskriptif kuantitatif dengan pendekatan bibliometrik dalil Lotka. Data penelitian berasal database Scopus tahun 2018-2022 dengan tipe artikel.
Data analisis. Data artikel penelitian diolah berdasarkan distribusi penulis; menghitung nilai parameter Lotka C; menghitung uji Kolmogorov-Sminrnov (K-S) menggunakan program Excel.
Hasil dan Pembahasan. Berdasarkan hasil penelitian diperoleh jumlah jurnal bidang Ilmu Perpustakaan dan Informasi terindeks Scopus Q1 sebanyak 61 jurnal dan 24.690 artikel. Berdasarkan analisis perhitungan hukum lotka, diketahui nilai C = 0,475 dan n = 1,591. Sehingga persamaan produktivitas pengarang terindeks Scopus pada jurnal Ilmu Perpustakaan dan Informasi tahun 2018-2022 adalah 0,475 yang menghasilkan jumlah kontribusi penulis dalam menerbitkan 1 artikel adalah 47,5 %. Selain itu, hasil analisis menunjukkan bahwa Dmax sebesar 0,286 dengan nilai kritis 0,010. Hasil tersebut menunjukkan Dmax lebih besar daripada nilai kritis yang berarti Produktivitas penulis bidang Ilmu Perpustakaan pada tahun 2018-2022 tidak sesuai dengan hukum Lotka.
Kesimpulan dan saran. Hasil Uji K-S menunjukkan tidak sesuai dengan dalil Lotka. Dmax lebih besar dari nilai kritis. Harapannya agar penelitian selanjutnya dengan metode *straight count* menggunakan pendakatan dalil Lotka.

Kata kunci: bibliometrik; hukum Lotka; produktivitas pengarang

ABSTRACT

Introduction. *The purpose of this study is to use Lotka's law to determine the pattern of author output in the field of Library Science in the Library Science Journal Q1 indexed by Scopus.*
Data Collection Methods. *The quantitative descriptive method was conducted, with a bibliometric approach to explore aspects of scientific articles.*
Data Analysis. *The research data was acquired from the Scopus International Journal, which can be viewed at*

www.scopus.com from 2018 to 2022, with article types.
Results and Discussion. *The research results found that the number of library science journals indexed by Scopus Q1 was 61. Based on the analysis of Lotka's law calculations, it is found that the value of C is 0,518 and the value of n was 1,717. The productivity equation for SCOPUS-indexed authors in Library Science journals for 2018–2022 was 0,518, which results in the number of author contributions in publishing one article being 51,84%. In addition, the results of the analysis show that Dmax was 0.280 with a critical value of 0,009.*
Conclusion. *These findings indicate that Dmax is bigger than the crucial value and it does not follow Lotka's law.*

Keywords: *bibliometrics; Lotka's Law; author productivity*

A. INTRODUCTION

The advancement of technology and the passage of time has led to the availability of study findings in digital form as well as print, which can now be accessed more widely. The rapid advancement of digital technology is one of the positive aspects of modern-day Indonesia (Jayanthi & Dinaseviani, 2022). Almost all study findings are published in various scientific journals, mostly in written form. The study of library science is expanding quickly in the realm of higher education. The field of library and information science in Indonesia has advanced significantly over the previous five to ten years. The utilization of bibliometric research can be used to evaluate research results produced by universities. So this bibliometric research can be used as a basis for evaluating universities in providing rewards to their lecturers.(Ibrahim & Fadhli, 2021; Laengle et al., 2020; Luo et al., 2018; Pacheco-Mendoza et al., 2020) Lotka's law of scientific production has played an important role in bibliometric research since its first in 1926, leading to its reexamination and study across numerous times (Sahu & Jena, 2022a). The bibliography is used as a study object in information science and library research utilizing mathematical and statistical methods. The goal of researching a writer's productivity is to determine how frequently the research results are employed and utilized by the community.

This study uses Lotka's law to determine the pattern of author production in the field of library science in the Journal of Library and Information Science Q1. Lotka's law is a bibliometric law that applies to author production. Lotka's Law is a fundamental Law in the field of bibliometrics that addresses the frequency of authorship within a certain academic domain (Ahmad & Batcha, 2020). To determine how much the research on the topic under review has influenced the development of science, the authors of a study must be aware of the productivity pattern. Previous studies in many scientific domains were looked into with the Lotka law method (Sahu & Jena, 2022b). Q1 journals have good quality in terms of citation ranking, it is not easy to get a Q1 ranking for a journal, it takes time, quality, consistency and high professionalism. This study differs from prior studies in that it focuses on research journals in the field of library and information science Q1 Scopus. The title of this study is "Analysis of Productivity Patterns of Library Science Authors in the Journal of Library and Information Science Q1 2018-2022 with Lotka's Law Approach."

The purpose of this study was to analyze/discover the level of creativity of the authors of Q1 journals in the field of Scopus-indexed information science libraries using Lotka's law approach. This makes it easy for other researchers to identify useful authors or publications, ensuring that researchers receive correct information.

B. LITERATURE REVIEW

1. Definition of Bibliometrics

The term bibliometrics is derived from the words biblio (book) and metric (measuring). Pritchard, Narimov, and Marchenko proposed the notion of bibliometrics circa 1969 (Tupan et al., 2018). Bibliometrics has been used in a variety of sectors other than library science over time (Rohanda & Winoto, 2019). In general, bibliometrics frequently adopts a descriptive study approach to identify an author's gender,

type of work, level of collaboration, organizational productivity, and article topic (Pattah, 2013) .Bibliometrics is also utilized to demonstrate a subject's prowess or superiority through author analysis, citation analysis, and collaborative study in existing literature (Nuryudi, 2017). The primary goal of bibliometrics is to define the nature and direction of written communication development through descriptive calculations and analysis of various aspects of communication (Basuki, 2016).

The bibliographic technique employs a reference list of other papers that can be used to apply statistical models in scientific communication. The objective of literary works, according to the two assertions above, is to analyze the process of evolution of written scientific communication and to investigate the use and development of literary works through citation analysis. Bibliographic analysis has recently gained popularity among librarians and researchers. Researchers can assess the influence of their research by analyzing reference resources. The more frequently academics and other writers cite to an article, the bigger its impact on the advancement of science and technology.

2. Lotka's Law

Lotka is a method for calculating the productivity of journal writers. Lotka law explains or defines the frequency with which authors (writers) in a certain discipline publish scientific publications (Antony & Raja, 2020; Da Silva et al., 2019; Kherde, 2020). Determining one author from a work with multiple authors is an important aspect of Lotka's law analysis. As a result, one of three methods is typically used: modified count, complete count, or straight count. Lotka employed the straight count Law, sometimes known as the senior count or major count, in his research. Other experts frequently utilize the adjusted count and complete count procedures to determine the author.

Lotka's Law is a mathematical method for determining population sizes and forecasting future growth. Lotka's Law itself operates to determine the pattern of productivity of article writers in a certain field of science and checks the appropriateness of Lotka's Law's frequency distribution with the frequency distribution of writing articles in that field of science.

Lotka's Law, along with Bradford's Law on the dissemination of scientific publications in multiple journals and Zipf's Law on word frequency, is one of the primary objectives of research in bibliometrics. To determine if calculations based on Lotka's Law apply, two sets of observational data must be examined using non-parametric statistical tests. The Kolmogorov-Smirnov Test (K-S Test) is the most appropriate test for measuring the degree of appropriateness of two data sets or two distributions (Goodness of fit). Everyone can now easily take out the K-S test with the use of internet system facilities, because the automatic application programmed is available and can be easily obtained and executed; all that is required is access to the internet.

In order to make decisions on how to manage a writer's productivity, Lotka's Law is used in this article to determine the pattern of a writer's productivity. Lotka's Law is also utilized to determine the dynamics of population expansion, making it particularly beneficial for making well-informed choices regarding how to manage the output of writers and their resources.

3. Previous Research

1. Bibliometric Analysis of Unri Lecturers' Scientific Publication Productivity in Scopus Indexed Journals Using Lotka's Law Proof

   This investigation's goal was to evaluate the publishing habits of University of Riau professors in Scopus-registered, published publications. The frequency distribution of article authors is examined in this study in relation to Lotka's law frequency distribution. In this work, descriptive techniques and literature analysis are used. The study sample consisted of his 1,128 lectures, and the data gathered was documented. His Scopus-indexed scholarly publication production at University of Riau department produced

over 3,748 publications, according to the findings. However, the study's findings suggest that Professor Unri's scientific publication productivity model contradicts Lotka's law. According to Lotka, 33.95% of lecturers publish articles, and 60% create books (Hasan & Yurnalis, 2022).

2. Testing Lotka's Law and the Pattern of Author Productivity in Artificial Intelligence Scholarly Publications

   The purpose of this research is to develop science indicators and compare them at the national and international levels. AI data from the web science database from 2008 to 2017 has been mapped, depicting average growth rates, relative growth rates, contributions made by authors given research productivity, authorship patterns, and AI literature collaborations. The K-S test was applied to measure the degree of agreement between the distribution of the observed data sets to eliminate the joint strength of the relationship and the theoretical value $\alpha = 2$. Lotka's inverse square law was discovered to behave in this manner (Ahmad et al., 2019).
3. Bibliometric Analysis of Article Writer Productivity in Agriculture in Indonesia Using Lotka's Law

   This study employs Lotka's Law to evaluate the productivity patterns of agricultural-related article authors in Indonesia between 2006 and 2015. The Ministry of Research, Technology, and Higher Education authorized the use of national periodicals as a source of research data. It was discovered that year that 2.650 authors who contributed 4141 papers in the topic of Agriculture. The C value is 0.80773 and the n value is 2.81500, according to Lotka's law computations. According to the findings of the investigation, 80.77% of writers contribute to a single article. The Kolmogorov-Smirnov test results show that the maximum deviation is 0.08396 with a critical value (with = 0.05) of 0.02642, indicating that the maximum deviation is greater than the preset critical value (Soplantila et al., 2017).
4. Lotka's Law and the Author Productivity Pattern of Information Literacy Research Output

   The purpose of this study is to uncover trends, sizes, and relative growth rates in the field of information literacy, as well as the timing of duplicate research results. In this study, the Kolmogorov-Smirnov (K-S) test was employed to assess the dependability of Lotka's law. The data for the information literacy study came from literature reviews retrieved from the Web of Science (WOS) between 2008 and 2017. The findings show that Lotka's law is applied in accordance with information literacy research technique. According to the author distribution, 41.71% of articles were written by a single author, 29.97% by two authors, 16.58% by three authors, and so on (Murugan et al., 2019).
5. Flipped classroom in the second decade of the Millenia : a Bibliometrics analysis with Lotka's law

   The purpose of this study is to assess the state of the flipped classroom studies and provide a path for further investigation into the area. We detect research activity on the flipped classroom by observing a sample of 1557 papers from the Scopus database using a bibliometric technique. The search query contains the terms “flipped classroom” and “flipped learning”. We discussed the previous phases of the flipped classroom study, the patterns that followed, the status of publications according to the nation, institution, and source title, and we looked at the publication's citation pattern. We also talkthe about the topics according to the phrases and occurrences of the papers' titles, abstracts, and keywords. Using Lotka's rule, this work also makes predictions about future research in flipped classrooms. We discovered that the author's contribution is consistent with the legislation. We offer several possible study directions on the flipped classroom as a

conclusion. In order to ensure the flipped classroom approach's survival and growth in the ensuing decades, research on the subject focuses primarily on approaches, strategies, and effectiveness as perceived by practitioners and learners. Authors' contributions, as well as predictions about their future and sustainable contribution and networking, are given relatively less attention. (Kushairi & Ahmi, 2021)

The previous study above focused on topics or subjects of information literacy, agriculture, ai, flipped classroom (education), lecturer publications. The difference from this research to previous study is that it focuses on journals indexed in scopus Q1.

C. RESEARCH METHODS

This study employs a quantitative descriptive method based on Lotka's law in bibliometrics. This inquiry makes use of scientific work as analytical input. The data source is an investigation of productivity patterns among writers in the field of library science in the Q1 Library and Information Science Journal utilizing the Lotka law approach via the SJR database, which will be retrieved via Scopus. The Scopus database was chosen because of its high quality and reputation, which has been recognized internationally by universities and research organizations (Hakim, 2020). A framework that was created during data collection is shown in figure 1.

Secondary data collecting is utilized after material has been placed into the Scopus database. The first step is to go to https://www.scimagojr.com/journalrank.php and retrieve the Q1 data set on Scimago Journal Rank. Then conduct a search using the subject category of the journal "Library and Information Science" in 2022. After obtaining the data via https://www.scimagojr.com/journalrank.php, the data is downloaded in the form of Microsoft Excel. (See table 1).

Open the SJR data, then copy it to a new sheet with only Q1 data conditions. Then, using a premium membership account, access the www.scopus.com website and enjoy all of its features and amenities. Then conduct an ISSN search for SJR data, limiting journals to those published between 2018 and 2022 and defining document formats per article category. Following data restriction, there is an opportunity to retrieve the necessary metadata. The acquired data is then downloaded in CSV format to facilitate processing. Download 1 ISSN at a time from SJR. After collecting 61 csv, they will be combined into one csv with a total 24.690 articles to assist research. Additionally, the CSV data set will be used for study.

Data processing:

Excel is used to store research data. The study data was manually categorized by the number of authors. Then, with 1 person totaling 2931, 2 people totaling 4264, 3 people totaling 3715, and so on, categorize articles. Then, in indexed library scientific articles Q1 from 2018 to 2022, compute the values of the parameters n and c. Then, for the years 2018-2022, perform the Kolmogorov Smirnov test on Q1 indexed library science papers (Jahina et al., 2020; Maz-Machado et al., 2017; Suradkar & Kalbande, 2021). Then, calculate the productivity of Scopus-indexed librarians for 2018–2022.

Bibliometric analysis by using the Lotka law approach $b = \frac{\sum XY - N\bar{X}\bar{Y}}{\sum X^2 - N\bar{X}^2}$ where b = -n, and the C value is taken from the following equation $C = \frac{1}{\sum \frac{1}{X^n}}$ Calculating Lotka's law theoretical distribution by using the equat$y_{x=C\frac{1}{X^n}}$ of Against the Lotka law by using the Kolmogorov Smirnov test (KS test) by using a critical value of $\alpha = 0.05$. The test's goal is to determine whether Lotka's law applies to the distribution of the observations. If the Dmax (Deviation maximal/D absolute) ratio exceeds the critical value, the alternative hypothesis (H1) is supported, which means that Lotka's Law does not apply to the distribution of data, and the null hypothesis (H0) is rejected. In contrast, if the Dmax value is less than the critical value and the hypothesis (H1) fails to hold, it is said that Lotka's Law is being followed by the distribution of the data and the null hypothesis (H0) is established. That the data is collected by ISSN, then the calculations are not done

manually but using the Excel software program so as to avoid bias.

D. RESULTS AND DISCUSSION

A keyword search is a subject with the library and information science category Q1 SCOPUS indexed journal articles is performed at https://www.scimagojr.com/journalrank.php. The results show that there are 61 journals in the topic of library science. Table 1 shows the contents of each journal.

The calculation of parameter values n and c

After acquiring journal data from SCOPUS for the discipline of Library and Information Science Q1, the data will be processed using the Lotka law postulate. In the data processing, there are indications x (number of articles generated by an author) and y (name of the author who created x articles). This procedure provides the foundation for computing the values of the parameters n and C in Lotka Law. Table 2 shows that the authors who generated one article were 16320 people, the authors who produced two articles were 2374 people, the authors who produced three articles were 792 people, and so on. Next, the value of n can be obtained by using the following formula:

b = -n

$$b = \frac{\sum(log\ log\ x\ \ (log\ log\ y)) - N\ X(N(Y))}{\sum(logx)^2 - N\ (logx)^2}$$

$$b = \frac{1675.235403 - 4951.46196}{2609.593749 - 44.0742839}$$

$b = \frac{-934.358345}{934.358345}$ = -1.717

b = -1.717

n = 1.717

Next, to determine the value of C by using the formula:

$C = \frac{1}{\sum_{x}^{1}}$

$$C = \frac{1}{\sum_{x=1}^{P-1}\frac{1}{x^n} + \frac{1}{(n-1)P^{n-1}} + \frac{1}{P^n} + \frac{n}{24(P-1)^{n+1}}} = 1.928$$

With a n value of 1.71746449, the C value obtained is as follows:

$C = \frac{1}{1.928}$

C = 0.518

The above is the result of calculating the parameter values n = 1.717 and C = 0.518, therefore the productivity equation of SCOPUS-indexed authors in Library and Information Science journals for 2018-2022 is Y_x . $X^{1,717}$ = 0.518. This resulted in the number of contributing authors in 2018–2022, who published 1 article, being 51.8%.

The Kolmogorov-Smirnov test

Further testing can be done with the Kolmogorov-Smirnov Test. This testing technique is carried out to determine whether the *Lotka Law postulate* can be used in a group of data, namely by knowing whether the initial hypothesis H (0) is accepted or rejected.

Based on the results of the Kolmogorov-Smirnov test in table 3, it can be seen that the high score D_{max} = 0.280. The Kolmogorov-Smirnov test uses a critical value of $\frac{1.36}{\sqrt{N}}$, therefore, the critical value of 0.009 is obtained. Thus, it was decided that the maximum deviation value is greater than the critical value. This decision makes the null hypothesis H (0) is rejected, which means that the distribution of productivity of writers in the Library Science for the period 2018-2022 is not in accordance with the lotka's law. it can be seen from the significant difference between the observation result of 79% and the lotka result value of 51% so that the Kolmogorov-Smirnov test value is not appropriate. This is different from the research conducted by Wahyudi et al. (2015) where the calculation results showed that the observation results were 63% with a lotka result value of 61%. Based on research conducted by Kushairi & Ahmi (2021), the author's productivity is in accordance with the Lotka law, there is a possibility that research on this topic will produce more articles in the future.

Productivity Patterns of Author and Sources in Library and Information Science in 2018 – 2022

According to the calculation statistics for the distribution of authors in the library and information area from 2001 to 2022, the most productive writers In this study, the prolific writer is the writer who made the most contributions within that time period. There are ten authors who fit this description. According to Figure 2, Zhang Y is the most productive writer, followed by Wang Y and Wang X. The works of prolific authors who have more than 50 publications. Zhang Y is the first author, with 93

publications, followed by Wang Y with 87, Wang X with 73, Li X with 69, and Li Y with 65.

Based on figure 3, the journals that have published the most articles with top rankings of 985 are the *Information Processing and Management journal,* followed by the *Information Communication and Society journal with 707 articles,* then the *Profesional de La Information journal with 660 articles,* next the *Journal of the Association for Information Science with 564 articles,* and the *Journal of Information Science with 475 articles*. According to with the previous research that these journals are productive journals in producing research in the field of library science as an example of research with the highest citation results in the subject of science is library science bibliography at 24.3% and followed by information resources at 21.7% (M. Tsay, 2013). It is hoped that further research can test Lotka's argument using the straight count method in the field of library science with reference to research in the field of physics and using the same method with inconsistent results (Kumar & Senthilkumar, 2019; Naheem et al., 2019; Naqvi & Fatima, 2017; Pillai Sudhier, 2013)

If the bibliometric research related to Lotka's law, than the topic or issue contained in the article analysis will continue to be a trend in the future (Kushairi & Ahmi, 2021). Previous research Lotka's law, research by Barik & Jena (2021) investigates author productivity in open access journals in the field of library and information science. Future studies of author productivity in LIS open access journals will be based on the practical implications of the research, allowing researchers to gain an overview of author productivity trends in these publications. This also relates to the research conducted by Amarathunga et al. (2024). This study used a comprehensive literature review and bibliometric analysis to analyze the literature on university-industry connections (UIL) both conceptually and empirically. The results showed that 1866 (90.6%) out of 2060 authors published only one article for each author, while 147 (7.1%) authors published two articles each under the UIL category.

E. CONCLUSION

The results of the Kolmogorov-Smirnov test demonstrate that the maximum deviation value is greater than the critical value. As a result of this decision, the null hypothesis H (0) is rejected, implying that the distribution of writers' productivity in library science does not follow Lotka's law from 2018 to 2022. The findings of our study reveal a new perspective on the methods used in "Library and Information Science" up to this point. We think that this research will be useful to writers who perform library and information science studies. So that the outcomes of research in the field of library and information science, like those in other fields, can be maximized. It is hoped that further research can test the Lotka argument with other methods such as straight count. This aims to prove whether the value obtained is the same or not through the straight count method and the complete count method.

REFERENCES

Ahmad, M., & Batcha, D. M. S. (2020). Examining the scientific productivity of authors in dyslexia research: A study using Lotka's law. *Library Philosophy and Practice*, *2020*, 1–21. https://digitalcommons.unl.edu/libphilprac/4198

Ahmad, M., Batcha, M. S., & Jahina, S. R. (2019). Testing Lotka's law and pattern of author productivity in the scholarly publications of artificial intelligence. *Library Philosophy and Practice*, *2019, [1-17]*. https://doi.org/10.48550/arXiv.2102.09182

Amarathunga, B., Khatibi, A., & Talib, Z. M. (2024). University–industry linkages and agendas for future studies: A systematic literature review and bibliometric analysis. *Asian Education and Development Studies*, *13*(1), 14–30. https://doi.org/10.1108/AEDS-08-2023-0104

Antony, J., & Raja, S. (2020). Price square Root law, Pareto principle, and Collaborations in Indian Geese Publication output: Scientometric assessment. *Library Philosophy and Practice*, *2020, [1-15]*.

https://digitalcommons.unl.edu/libphilprac/4014/

Barik, N., & Jena, P. (2021). Author productivity pattern and applicability of Lotka's inverse square law: A bibliometric appraisal of selected LIS open access journals. *Digital Library Perspectives*, *37*(3), 223–241. https://doi.org/10.1108/DLP-10-2020-0103

Basuki, S. (2016). Dari bibliometrika hingga informetrika. *Media Pustakawan*, *23*(1), 7–14. https://doi.org/10.37014/medpus.v23i1.836

Da Silva, S., Perlin, M., Matsushita, R., Santos, A. A. P., Imasato, T., & Borenstein, D. (2019). Lotka's law for the Brazilian scientific output published in journals. *Journal of Information Science*, *45*(5), 705–709. https://doi.org/10.1177/0165551518801813

Hakim, L. (2020). Analisis bibliometrik penelitian inkubator bisnis pada publikasi ilmiah terindeks scopus. *Procuratio: Jurnal Ilmiah Manajemen*, *8*(4), 176–189. https://www.ejournal.pelitaindonesia.ac.id/ojs32/index.php/PROCURATIO/article/view/677

Hasan, T., & Yurnalis. (2022). Kajian bibliometrik produktivitas publikasi ilmiah dosen UNRI pada jurnal terindeks scopus berdasarkan dalil Lotka's law. *Jurnal Gema Pustakawan*, *10*(2), 88–103. https://doi.org/10.31258/jgp.10.2.88-103

Ibrahim, C., & Fadhli, R. (2021). Performance of Indonesia's world-class university efficiency with bibliometrics (scientific strength) approach and data envelopment analysis. *Webology*, *18*(1), 32–50. https://doi.org/10.14704/WEB/V18I1/WEB18003

Jahina, S. R., Batcha, M. S., & Ahmad, M. (2020). Lotka's Law and pattern of author productivity in the field of brain concussion research: A scientometric analysis. *Library Philosophy and Practice*, *2020*, 1–18. https://arxiv.org/abs/2102.11983

Jayanthi, R., & Dinaseviani, A. (2022). Kesenjangan digital dan solusi yang diterapkan di Indonesia selama pandemi COVID-19. *Jurnal Ilmu Pengetahuan dan Teknologi Komunikasi*, *24*(2), 187–200. https://doi.org/10.17933/iptekkom.24.2.2022.187-200

Kherde, M. R. (2020). Applicability of inverse square law of scientific productivity in DESIDOC Journal of Library & Information Technology. *Library Philosophy and Practice*, *2020*, 1–8. https://digitalcommons.unl.edu/libphilprac/3789/

Kumar, S., & Senthilkumar, R. (2019). Applicability of Lotka's law in astronomy & astrophysics research of India. *Library Philosophy and Practice*, *2019, [1-14]*. https://digitalcommons.unl.edu/libphilprac/2129

Kushairi, N., & Ahmi, A. (2021). Flipped classroom in the second decade of the Millenia: A bibliometrics analysis with Lotka's law. *Education and Information Technologies*, *26*(4), 4401–4431. https://doi.org/10.1007/s10639-021-10457-8

Laengle, S., Merigó, J. M., Modak, N. M., & Yang, J. B. (2020). Bibliometrics in operations research and management science: A university analysis. *Annals of Operations Research*, *294*(1–2), 769–813. https://doi.org/10.1007/S10479-018-3017-6/TABLES/22

Luo, F., Sun, A., Erdt, M., Sesagiri Raamkumar, A., & Theng, Y.-L. (2018). Exploring prestigious citations sourced from top universities in bibliometrics and altmetrics: A case study in the computer science discipline. *Scientometrics*, *114*(1), 1–17. https://doi.org/10.1007/s11192-017-2571-z

Maz-Machado, A., Madrid, M. J., Jiménez-Fanjul, N., & León-Mantero, C. (2017). Empirical examination of lotka's law for information science and library science. *Pakistan Journal of Information Management and Libraries*, *19*, 37–51. http://eprints.rclis.org/32817/

Murugan, M., Saravanakumar, R. R., & Thirumagal, A. (2019). Lotka's law and pattern of author productivity of

information literacy research output. *Library Philosophy and Practice*, *2019, [1-9]*. https://digitalcommons.unl.edu/libphilprac/2509

Naheem, K. T., Sivaraman, P., & Saravanan, G. (2019). Application of Lotka's law in Bell's palsy (facial paralysis) research output during 2004 - 2018. *Library Philosophy and Practice*, *2019, (1-10]*. https://digitalcommons.unl.edu/libphilprac/2892/

Naqvi, S. H., & Fatima, N. (2017). Authorship patterns in international business literature: Applicability of Lotka's law. *Annals of Library and Information Studies*, *64*(4), 253–259. http://op.niscair.res.in/index.php/ALIS/article/view/16390/1436

Nuryudi, N. (2017). Analisis bibliometrika Islam: Studi kasus dokumentasi publikasi ilmiah di UIN Syarif Hidayatullah Jakarta. *Al Maktabah*, *15*(1), 1–15. https://doi.org/10.15408/almaktabah.v15i1.4713

Pacheco-Mendoza, J., Alhuay-Quispe, J., & Machin-Mastromatteo, J. D. (2020). Bibliometrics units as dynamic engines for universities' scientific production. *Information Development*, *36*(2), 301–305. https://doi.org/10.1177/0266666920918466

Pattah, S. H. (2013). Pemanfaatan kajian bibliometrika sebagai metode evaluasi dan kajian dalam ilmu perpustakaan dan informasi. *Khizanah Al-Hikmah : Jurnal Ilmu Perpustakaan, Informasi, Dan Kearsipan*, *1*(1), 47–57. https://journal.uin-alauddin.ac.id/index.php/khizanah-al-hikmah/article/view/25

Pillai Sudhier, K. G. (2013). Lotka's law and pattern of author productivity in the area of physics research. *DESIDOC Journal of Library and Information Technology*, *33*(6), 457–464. https://doi.org/10.14429/djlit.33.5477

Rohanda, R., & Winoto, Y. (2019). Analisis bibliometrika tingkat kolaborasi, produktivitas penulis, serta profil artikel Jurnal Kajian Informasi & Perpustakaan tahun 2014-2018. *Pustabiblia: Journal of Library and Information Science*, *3*(1), 1–16. https://doi.org/10.18326/PUSTABIBLIA.V3I1.1-16

Sahu, A., & Jena, P. (2022a). Lotka's law and author productivity pattern of research in law discipline. *Collection and Curation*, *41*(2), 62–73. https://doi.org/10.1108/CC-04-2021-0012

Sahu, A., & Jena, P. (2022b). Lotka's law and author productivity pattern of research in law discipline. *Collection and Curation*, *41*(2), 62–73. https://doi.org/10.1108/CC-04-2021-0012

Soplantila, P. A., Sitanggang, I. S., & Basuki, S. (2017). Analisis bibliometrika menggunakan hukum Lotka. *Jurnal Pustakawan Indonesia*, *16*(1), 1–10. https://journal.ipb.ac.id/index.php/jpi/article/download/25670/16702/

Suradkar, P. A., & Kalbande, D. (2021). Testing Lotka's law and pattern of author productivity in the Maharashtra University of Health Services (MUHS) Consortium: A bibliometric approach. *Library Philosophy and Practice*, *2021, [1-16]*. http://eprints.rclis.org/42404/

Tsay, M. (2013). Knowledge input for the domain of information science. *Aslib Proceedings*, *65*(2), 203–220. https://doi.org/10.1108/00012531311314005

Tupan, T., Rahayu, R. N., Rachmawati, R., & Rahayu, E. S. R. (2018). Analisis bibliometrik perkembangan penelitian bidang ilmu instrumentasi. *Baca: Jurnal Dokumentasi Dan Informasi*, *39*(2), 1–15. https://doi.org/10.14203/j.baca.v39i2.413

Wahyudi, A., Kustiyo, A., & Basuki, S. (2015). Analisis pola produktivitas penulis artikel bidang perpustakaan dan informasi di Indonesia : Suatu kajian bibliometrika. *Jurnal Pustakawan Indonesia*, *14*(2), 25-34. https://doi.org/10.29244/jpi.14.2.%25p

LIST OF FIGURE

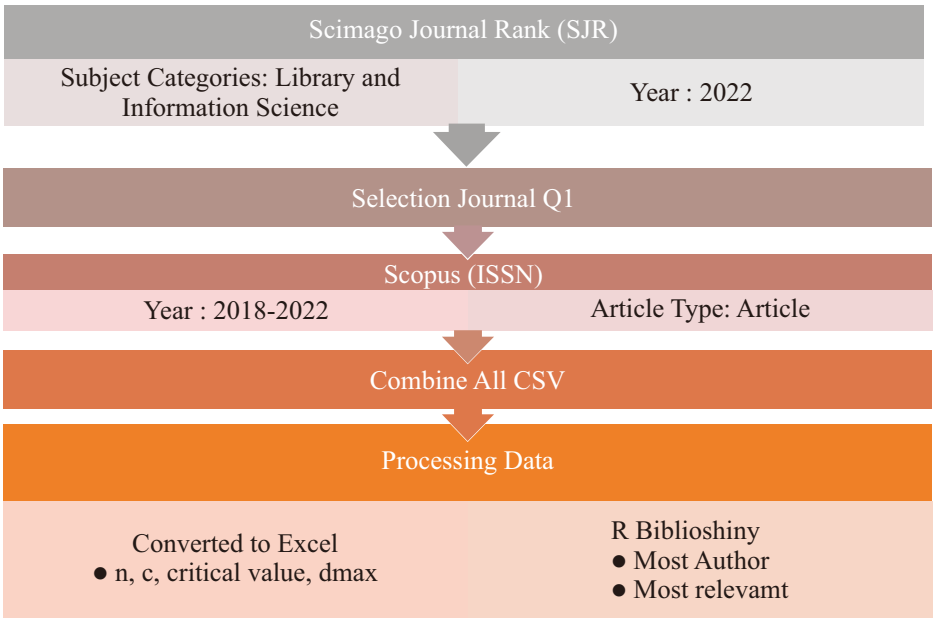

Figure 1 Research flow
Source: The authors processed data, 2023

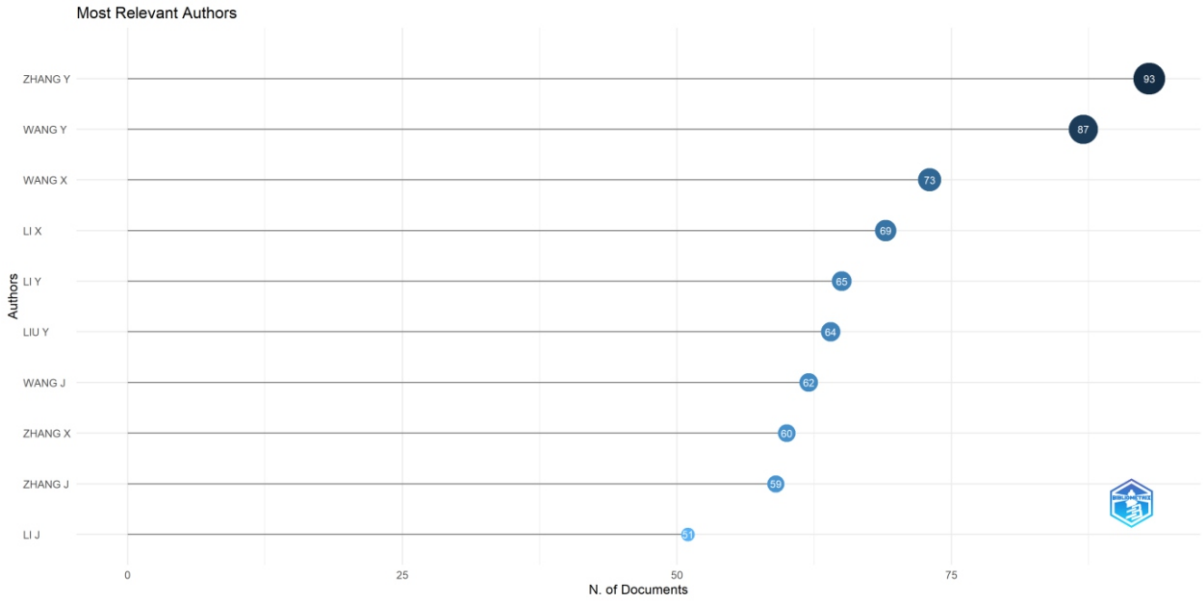

Figure 2. Most Relevant Authors
Source: R (Biblioshiny)

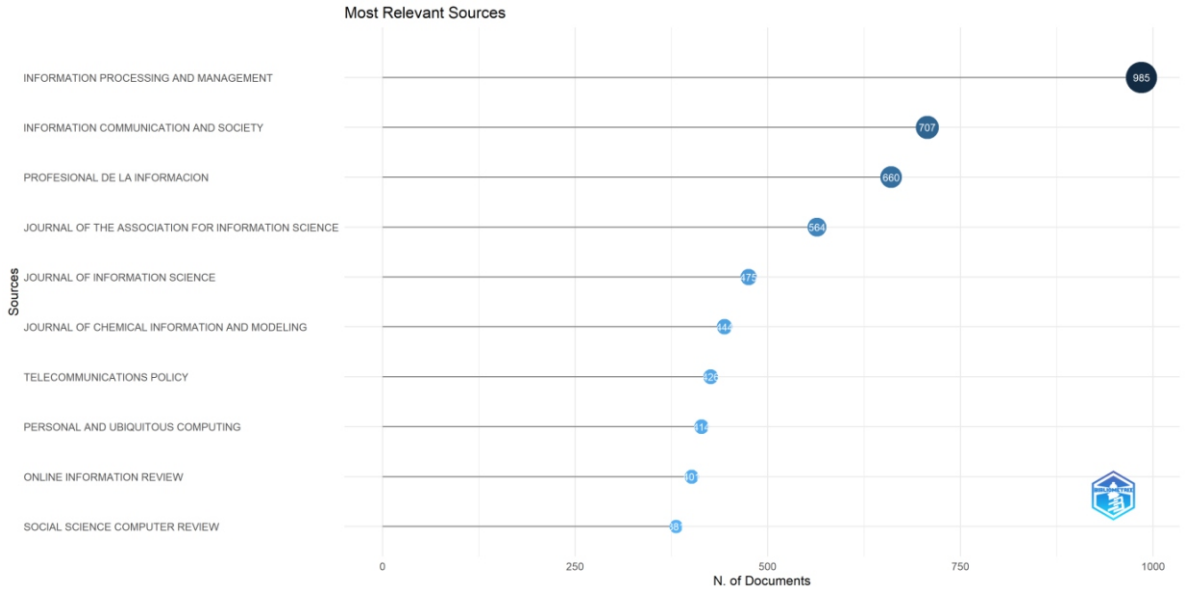

Figure 3. Most Relevant Sources
Source: R (Biblioshiny)

LIST OF TABLE

Table 1. Journals of Library and Information Science Indexed by SCOPUS Q1

No	Journal Name	ISSN	Number of Articles
1	Journal of Chemical Information and Modeling	15499596	2256
2	IEEE Transactions on Information Theory	189448	2153
3	Scientometrics	1389130	1769
4	Education and Information Technologies	13602357	1761
5	Information Processing and Management	3064573	984
6	Information Communication and Society	1369118X	739
7	International Journal of Information Management	2684012	687
8	Professional de la Information	16992407	660
9	Journal of the Association for Information Science and Technology	23301635	558
10	Journal of Academic Librarianship	991333	553
11	International Journal of Geographical Information Science	13658816	522
12	Scientific data	20524463	500
13	Information Technology and People	9593845	498
14	Journal of Information Science	1655515	475
15	ArchivalScience	13890166	465
16	Journal of Health Communications	10870415	462
17	Journal of Documentation	220418	425
18	Telecommunications Policy	3085961	420
19	Journal of Informetrics	17511577	417
20	Personal and Ubiquitous Computing	16174917	414
21	Online Information Reviews	14684527	401
22	Journal of Librarianship and Information Science	17416477	399
23	Social Science Computer Reviews	15528286	381
24	Journal of Cheminformatics	17582946	372
25	Government Information Quarterly	0740624X	352
26	Knowledge Management Research and Practice	14778246	334
27	Journal of Enterprise Information Management	17410398	331
28	Journal of Library Administration	1930826	319
29	Information Systems Research	10477047	306
30	Journal of the Medical Library Association : JMLA	15365050	300
31	Big Data and Society	20539517	294
32	Aslib Journal of Information Management	20503814	283
33	College and Research Libraries	100870	249
34	European Journal of Information Systems	14769344	222
35	Ethics and Information Technology	13881957	218
36	Information and Learning Science	23985348	209
37	Portal	15307131	197
38	Medical Reference Services Quarterly	15409597	180
39	Health Information and Libraries Journal	14711842	175
40	Library and Information Science Research	7408188	166
41	Library Trends	242594	164
42	Journal of Classification	1764268	154
43	Reference Services Review	907324	148
44	Research Evaluation	9582029	143
45	World Patent Information	1722190	141
46	Information Systems Management	10580530	132
47	Information Technology and Libraries	7309295	122
48	Collection Management	15452549	120
49	Education for Information	1678329	113
50	Library Quarterly	242519	110
51	International Journal of Multimedia Information Retrieval	21926611	108
52	New Review of Academic Librarianship	7407834	101
53	Journal of Library and Information Services in Distance Learning	1533290X	97
54	Journal of Information Technology	2683962	95
55	Journal of Information Literacy	17505968	93
56	Information Retrieval	15737659	92
57	Computers in the Schools	7380569	91
58	Information and Organization	14717727	83
59	bottom line	0888045X	65
60	Journal of Web Librarianship	19322909	57
61	International Journal of Law and Information Technology	14643693	55

Source: The authors excel processed data, 2023

Table. 2 Productivity Analysis of Authors

Number of Articles (x)	**Number of Authors (y)**	X = logx	Y = log y	log x (log y)	$(\log ⁇)^2$
1	16320	0	4.212720154	0	0
2	2374	0.301029996	3.375480715	1.016120945	0.090619058
3	792	0.477121255	2.898725182	1.383043396	0.227644692
4	335	0.602059991	2.525044807	1.520228455	0.362476233
5	183	0.698970004	2.26245109	1.581385448	0.488559067
6	104	0.77815125	2.017033339	1.569557015	0.605519368
7	58	0.84509804	1.763427994	1.490269541	0.714190697
8	40	0.903089987	1.602059991	1.446804337	0.815571525
9	33	0.954242509	1.51851394	1.449030553	0.910578767
10	21	1	1.322219295	1.322219295	1
11	28	1.041392685	1.447158031	1.507059788	1.084498725
12	21	1.079181246	1.322219295	1.426914266	1.164632162
13	16	1.113943352	1.204119983	1.34132145	1.240869792
14	10	1.146128036	1	1.146128036	1.313609474
15	7	1.176091259	0.84509804	0.993912418	1.38319065
16	6	1.204119983	0.77815125	0.93698747	1.449904933
17	4	1.230448921	0.602059991	0.740804067	1.514004548
18	11	1.255272505	1.041392685	1.307231605	1.575709062
19	4	1.278753601	0.602059991	0.769886382	1.635210772
20	8	1.301029996	0.903089987	1.174947162	1.69267905
21	4	1.322219295	0.602059991	0.796055337	1.748263863
22	4	1.342422681	0.602059991	0.808218988	1.802098654
23	6	1.361727836	0.77815125	1.059630218	1.854302699
24	3	1.380211242	0.477121255	0.658528119	1.904983072
25	7	1.397940009	0.84509804	1.181396361	1.954236268
26	1	1.414973348	0	0	2.002149575
27	3	1.431363764	0.477121255	0.682934075	2.048802225
28	1	1.447158031	0	0	2.094266368
29	1	1.462397998	0	0	2.138607904
30	1	1.477121255	0	0	2.181887201
32	2	1.505149978	0.301029996	0.453095291	2.265476457
33	3	1.51851394	0.477121255	0.724515276	2.305884586
34	1	1.531478917	0	0	2.345427673
35	4	1.544068044	0.602059991	0.929621593	2.384146126
37	2	1.568201724	0.301029996	0.472075758	2.459256647
38	2	1.579783597	0.301029996	0.475562249	2.495716212
39	1	1.591064607	0	0	2.531486584
40	2	1.602059991	0.301029996	0.482268112	2.566596216
41	1	1.612783857	0	0	2.601071768
43	1	1.633468456	0	0	2.668219195
51	1	1.707570176	0	0	2.915795906
59	1	1.770852012	0	0	3.135916847
60	1	1.77815125	0	0	3.161821869
62	1	1.792391689	0	0	3.212667969
64	1	1.806179974	0	0	3.262286098
65	1	1.812913357	0	0	3.286654839
69	1	1.838849091	0	0	3.381365979
73	1	1.86332286	0	0	3.471972081
87	1	1.939519253	0	0	3.761734931
93	1	1.968482949	0	0	3.874925119
51		**66.3884658**	**39.30793877**	**32.84775301**	**97.08748951**

Source: The authors excel processed data, 2023

Table. 3 Authors Productivity Analysis (Kolmogorov-Smirnov Test)

Number of Articles (x)	**Number of Authors (y)**	% number of authors [y']	cumulative sum y'[Sn(x)]	Lotka's Law Theoretical Frequency [Yx]	cumulative sum of theoretical frequencies y'[F0(x)]	D max F0(x)-Sn(x)
1	16320	0.798629802	0.798629802	0.518486003	0.518486003	-0.280143799
2	2374	0.116173232	0.914803034	0.157662609	0.676148612	-0.238654422
3	792	0.038757034	0.953560069	0.078577503	0.754726115	-0.198833954
4	335	0.016393443	0.969953511	0.047942467	0.802668582	-0.167284929
5	183	0.008955224	0.978908735	0.032679912	0.835348494	-0.143560241
6	104	0.005089308	0.983998043	0.023894057	0.859242551	-0.124755492
7	58	0.002838268	0.98683631	0.018336277	0.877578828	-0.109257482
8	40	0.001957426	0.988793736	0.014578474	0.892157301	-0.096636435
9	33	0.001614876	0.990408613	0.011908564	0.904065866	-0.086342747
10	21	0.001027649	0.991436261	0.009937395	0.914003261	-0.077433001
11	28	0.001370198	0.99280646	0.008436884	0.922440145	-0.070366315
12	21	0.001027649	0.993834108	0.007265769	0.929705913	-0.064128195
13	16	0.00078297	0.994617079	0.006332554	0.936038467	-0.058578611
14	10	0.000489356	0.995106435	0.005575744	0.941614211	-0.053492224
15	7	0.00034255	0.995448985	0.0049527	0.946566912	-0.048882073
16	6	0.000293614	0.995742598	0.004433061	0.950999973	-0.044742626
17	4	0.000195743	0.995938341	0.003994705	0.954994678	-0.040943663
18	11	0.000538292	0.996476633	0.003621188	0.958615866	-0.037860767
19	4	0.000195743	0.996672376	0.00330007	0.961915936	-0.03475644
20	8	0.000391485	0.997063861	0.00302179	0.964937725	-0.032126136
21	4	0.000195743	0.997259604	0.002778896	0.967716622	-0.029542982
22	4	0.000195743	0.997455346	0.00256551	0.970282132	-0.027173214
23	6	0.000293614	0.99774896	0.002376938	0.97265907	-0.02508989
24	3	0.000146807	0.997895767	0.002209394	0.974868464	-0.023027303
25	7	0.00034255	0.998238317	0.002059798	0.976928262	-0.021310054
26	1	4.89356E-05	0.998287252	0.00192562	0.978853882	-0.01943337
27	3	0.000146807	0.998434059	0.001804765	0.980658647	-0.017775412
28	1	4.89356E-05	0.998482995	0.001695487	0.982354134	-0.016128861
29	1	4.89356E-05	0.998531931	0.001596322	0.983950456	-0.014581475
30	1	4.89356E-05	0.998580866	0.00150603	0.985456486	-0.01312438
32	2	9.78713E-05	0.998678737	0.001348017	0.986804503	-0.011874234
33	3	0.000146807	0.998825544	0.001278625	0.988083129	-0.010742416
34	1	4.89356E-05	0.99887448	0.001214721	0.989297849	-0.009576631
35	4	0.000195743	0.999070223	0.001155726	0.990453575	-0.008616647
37	2	9.78713E-05	0.999168094	0.001050525	0.9915041	-0.007663994
38	2	9.78713E-05	0.999265965	0.001003494	0.992507594	-0.006758371
39	1	4.89356E-05	0.999314901	0.00095971	0.993467304	-0.005847597
40	2	9.78713E-05	0.999412772	0.000918874	0.994386178	-0.005026594
41	1	4.89356E-05	0.999461708	0.00088072	0.995266898	-0.004194809
43	1	4.89356E-05	0.999510644	0.000811546	0.996078444	-0.003432199
51	1	4.89356E-05	0.999559579	0.000605405	0.996683849	-0.00287573
59	1	4.89356E-05	0.999608515	0.00047137	0.997155219	-0.002453296
60	1	4.89356E-05	0.99965745	0.000457958	0.997613176	-0.002044274
62	1	4.89356E-05	0.999706386	0.00043288	0.998046057	-0.001660329
64	1	4.89356E-05	0.999755322	0.000409909	0.998455965	-0.001299356
65	1	4.89356E-05	0.999804257	0.000399138	0.998855103	-0.000949154
69	1	4.89356E-05	0.999853193	0.000360229	0.999215332	-0.000637861
73	1	4.89356E-05	0.999902129	0.000326999	0.999542331	-0.000359798
87	1	4.89356E-05	0.999951064	0.000241925	0.999784257	-0.000166808
93	1	4.89356E-05	1	0.000215743	1	0
51	**20435**					

Source: The authors excel processed data, 2023