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### RELATIONSHIP OF INPUT AND OUTPUT VARIABLES WITH DATA ENVELOPMENT ANALYSIS APPROACH: AN EFFICIENCY IMPLEMENTATION STUDY PUBLISHED IN SINTA 2 AND SINTA 3 OF THE LIBRARY SCIENCE JOURNAL

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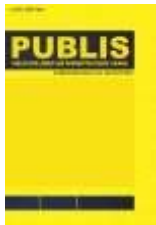
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#### Abstract

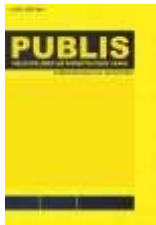
When the impact produced by the output variable (H-Index) is greater than that of the input variable (Impact Factor), the quality of a journal is said to be efficient. This investigation aims to evaluate the effectiveness of SINTA 2 and 3-indexed library science journals. This study examines the relationship between input and output variables using the Data Envelopment Analysis (DEA) method to measure efficiency in a library science journal that is indexed by SINTA accredited 2 and 3. A data-driven technique for calculating the full factor efficiency of homogeneous decision units is called data envelopment analysis (DEA). If the impact produced by the ranking of the output variable (H-Index) is greater than that of the input variable (Impact Factor), then the Library Science Journal is said to be efficient. Four out of the eight library science journals indexed by SINTA 2 and 3 are deemed efficient, according to the study's findings. *Jurnal Berkala Ilmu Perpustakaan dan Informasi, Jurnal Baca Dokumentasi dan Informasi, Jurnal Kajian Informasi dan Perpustakaan, dan Jurnal Pustakaloka: Jurnal Kajian Informasi dan Perpustakaan*



## **INTRODUCTION**

Research is currently widely carried out by an institution, such as research institutions, educational institutions, and even by the general public. The final result obtained from a research activity is one of them in the form of scientific papers which is the output that the research activity has been completed. For educational institutions, especially universities, research activities are usually carried out by students. There is Circular Letter No. 152 / E / T / 2012 contains the obligation of a student as a requirement for graduation at the S1-S3 levels to be able to publish his scientific work in accredited national or international scientific journals. (Adila, 2022; Saputra, 2020) said that a scientific journal is a place for the publication of scientific papers, with the quality and substance of a journal all in every word, sentence, and paragraph. To support the publication of scientific papers to an accredited national or international scientific journal, a researcher in publishing a scientific paper resulting from a study will always consider in which journal the work will be published. In doing publications, it is very necessary to choose a journal with a good reputation and quality. \_(Chen et al., 2021)\_

Journal reputation is useful for determining the good name or quality of the journal. Previous research conducted provided research results stating that a respondent noted an accurate reason for using the journal's reputation as the quality of the journal was indeed considered as the power holder for determining the quality of his articles (Campbell et al., 1999). Two indicators can be observed in looking at a reputable journal, including quantity and quality indicators (Abramo et al., 2008; Durieux & Gevenois, 2010). A journal's quality may be determined not just by citation metrics like Scimago Journal Rank or Impact factor but also by evaluations given by recent college graduates in each field of study (Miemczyk et al., 2012). According to (Evans et al., 2014) states that the quality of a journal is often considered the power holder to determine the quality of an article. The indicator of a reputable journal does not only look at its quality, but in terms of quantity, it is also important in a journal's reputation. The quantity



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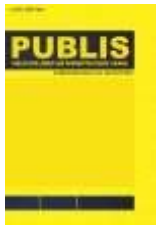
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indicator measures the output of productivity using evaluative procedures like top journal publications, top country publications, top authors on certain themes, top authors' citations, and so forth (Anand et al., 2021). This quantity measurement cannot be used as a reference in determining a journal. Journals are eligible if they have been listed in international indexing databases like Scopus. Indonesia itself has a national standard scientific journal with a good reputation and accreditation, namely the SINTA journal (Adila, 2022) says that SINTA is a venue for exchanging research and web-based information systems developed by the Director General of Research and Development of the Ministry of Ristekdikti of the Republic of Indonesia in 2016 with all people in Indonesia. SINTA Journal has six categories or levels including SINTA 1,2,3,4,5 & 6. In the SINTA journal, there have been many scientific fields indexed, one of which is the field of Library and Information Science.

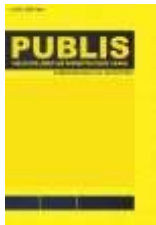
The field of Library Science and Information Science itself is a discipline that focuses on information management, Library science focuses on managing, collecting, and disseminating information through libraries and other information resources. From the results obtained directly in the SINTA journal database, there are already 25 journals of Library Science, Information Science, and Documentation studies indexed, and this may continue to grow. That way that studies in the fields of library science, information, science, and documentation are on the rise. However, all journals in SINTA can be said to be efficient to be used as a place for publication of a scientific journal, especially in the journal of Library Science, Information Science, and Documentation studies. Therefore, finding out the performance of a journal can be done by evaluating the efficiency of the journal. A journal can be said to be efficient if the ranking of the output variable (H-Index) produces an impact that is superior to the input variable (Impact factor) (Harzing & Van Der Wal, 2009).

SINTA 2 and 3 can use bibliometric calculations with Data Envelopment Analysis



(DEA) methods or techniques to assess efficiency in library journals. Bibliometrics, which derives from the words "Biblio" and "metric," is one of the sciences whose research findings are used in calculations (Glänzel, 2006). The whole factor efficiency of homogeneous decision units (DMUs) can be estimated using the data-oriented technique known as data envelopment analysis (DEA). (Cooper et al., 2011). The use of DEA in analyzing a journal is very profitable. The use of DEA in analyzing a journal is, in fact, very profitable. This DEA technique can be used to compare the efficiency of input and output relationships in a journal because it allows us to compare outputs (quotes, impact factors, and other outputs), and in addition to outputs, we can also compare inputs (articles) from various disciplines (Rosenthal & Weiss, 2017). The inputs and outputs in the DEA have various units, and the DEA allows researchers to directly compare the DMUs under consideration (Teodorović & Nikolić, 2021). Calculations performed by the DEA can also be used to compare the relative efficiencies of different units within the same group. Any journal that achieves a measure of efficiency is called a DEA score, if the journal is not dominated its DEA score equals 1.

Here are some previous studies that have succeeded in measuring the efficiency of a journal in various fields. (Petridis et al., 2013), The research conducted measures the efficiency of a journal in the forestry sector using bibliometric data with a data envelope analysis approach (Lee & Shin, 2014); the research conducted was efficiency measurement in multidisciplinary journals using the DEA approach; (Chen et al., 2017). The research conducted tested the performance of management science journals and operations research using the DEA model approach. Several things distinguish the input and output variables in this study from previous research. In previous research conducted by Patricia Giraldo with the title "Worldwide Research Trends on Wheat and Barley: A Bibliometric Comparative Analysis"; the input variable is the number of publications in the field of wheat and barley research (Giraldo et al., 2019). Other



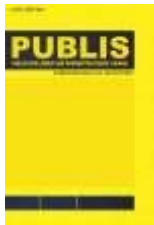
previous research conducted by Jeroen Baas with the title “Scopus as a Curated, High-quality Bibliometric Data Source for Academic Research in Quantitative Science Studies” using input variables in the form of the percentage of publications in the fields of health sciences, physical sciences, social sciences, and life sciences in scientific publishers Elsevier, Springer Nature, Taylor & Francis, Wiley-Blackwell, Sage, and other scientific publishers (Baas et al., 2020). Meanwhile, previous research that discusses output variables, namely related to the H5-Index in research conducted by Renjith with the title “Journal’s Self Citations and its Impact on h5 index of Library and Information Science (LIS) Journals of Prominent Countries: A Statistical Analysis Based on Journal Scholar Metrics”, This previous study examined the effect of self citation of LIS journals on the H5-Index of journals from leading countries such as the United States and the United Kingdom. (Renjith & Vijayan, 2017).

Based on the considering the previously research, researchers attempted to conduct new research using DEA, which sets it apart from the earlier research in that it examined the relationship between input and output variables while implementing the DEA model effectively. These studies were published in scientific journals in the fields of library and information science that were indexed in Sinta 2 and Sinta 3, respectively.

## **METHODS**

This research uses a research unit in the form of scientific journals indexed by SINTA in the field of Library Science and Information Science, which is focused on SINTA 2 and 3. The method used in collecting data, namely by documentation techniques or obtaining data related to the required journals is available on the SINTA website. The results of data collection that have been found are 8 journals in the field of Library Science and Information Science which are used as DMU (Decision Making Unit) to determine efficiency in SINTA 2 and 3 journals.

**Table 1.** Journal of Library Science and Information Science Indexed by SINTA 2 & 3  
(Source: Excel processed data author, 2023)



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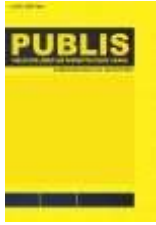
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No	Journal Name	Publisher	Accreditation
1.	Khizanah Al-Hikmah: Jurnal Ilmu Perpustakaan, Informasi, dan Kearsipan	Universitas Islam Negeri Alaudin	SINTA 2
2.	Jurnal Berkala Ilmu Perpustakaan dan Informasi	Universitas Gadjah Mada	SINTA 2
3.	Baca: Jurnal Dokumentasi dan Informasi	Lembaga Ilmu Pengetahuan Indonesia	SINTA 2
4.	Jurnal Kajian Informasi dan Perpustakaan Lentera Pustaka: Jurnal	Universitas Padjdjaran Program Studi Ilmu	SINTA 2
5.	Kajian Ilmu Perpustakaan, Informasi, dan Kearsipan	Perpustakaan Fakultas Ilmu Budaya Universitas Diponegoro	SINTA 3
6.	Record and Library Journal	Prodi Teknisi Perpustakaan Fakultas Vokasi Universitas Airlangga	SINTA 3
7.	EduLib: Journal of Library and Information Science Pustakaloka: Jurnal Kajian	Fakultas Ilmu Pendidikan Universitas Pendidikan Indonesia Institut Agama Islam	SINTA 3
8.	Informasi dan Perpustakaan	Negeri Ponorogo	SINTA 3

### 1) Determination of Input and Output Variables

In measuring the efficiency of a journal, it is necessary to determine variables to determine the research of the journal. The variables entered and controlled are input variables, while the variables that are generated and entered are called output variables. According to (Xu et al., 2020) states that selecting input and output variables is The most important step in evaluating the use of DEA models is to select input and output variables but this step still does not meet the unique standards for determining them. The input and output variables used in this study are as follows.

**Table 2.** Input Variables and Output Variables



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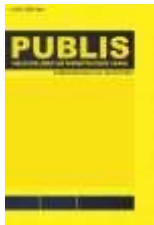
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(Source: Excel processed data author, 2023)

Input Variables

Number of Authors

Number of Publications



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Output Variables	<div style="border-top: 1px solid black; display: inline-block; padding-top: 2px;">Impact Factor</div>
	H5-Index

### 2) Data Collection Techniques

The analysis method used in data collection focuses on SINTA 2 and 3 accredited journals in the fields of library and information science in 5 years, 2018-2022, but the data sources of the input and output variables are different. In the process of collecting the author's data, it will go through a process of collecting data in each volume and publishing each year then processed with Microsoft Excel formatting tools to obtain information on how many of the authors wrote in the learned journal. The variable data such as impact factor, H5-index, number of authors, and number of publications in each SINTA journal.

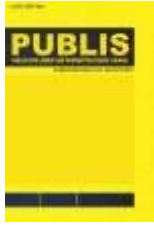
**Table 3.** Input and Output Variables Period 2018-2022  
(Source: Excel processed data author, 2023)

Journal	Impact Factor	H5-Index	Number of Publications	Number of Authors
Khizanah Al-Hikmah: Jurnal Ilmu Perpustakaan, Informasi, dan Kearsipan.	1,00	18	89	217
Jurnal Berkala Ilmu Perpustakaan dan Informasi	0,68	14	64	159
Baca: Jurnal Doumentasi dan Informasi	6,47	11	92	201
Jurnal Kajian Informasi dan Perpustakaan	2,68	19	70	170
Lentera Pustaka: Jurnal Kajian Ilmu Perpustakaan, Informasi, dan Kearsipan	0,96	9	64	132
Record and Library Journal	0,30	12	120	254
EduLib: Journal of Library and Information Science	4,49	9	89	215
Pustakaloka: Jurnal Kajian Informasi dan Perpustakaan	8,27	14	78	136

### 3) Data Analysis Techniques

The data collected was analyzed using software, namely the DEAP application.





The DEAP application is a program that works based on the concept of DEA constraints to calculate technical and cost efficiency. There are two DEAP program models, namely the CRS and CRS model (Fatimah & Mahmudah, 2017). The DEAP application software makes calculations easier. To determine the level of efficiency and decision-making ability for accreditation of SINTA 2 and 3 journals in the field of library science and informatics. Adjust with the DEA correction used, this is solved in equation 1 Maximize:

$$Eb = \frac{\sum_r^R = 1 u_{rb} y_{rb}}{\sum_l^I = 1 v_{lb} x_{lb}}$$

Constraint function:

$$\sum_r^R = 1 u_{rb} y_{rj} \leq 1, \forall j, j = 1, 2, 3, \dots, N$$

$$\sum_l^I = 1 v_{lb} x_{lj}$$

And

$u_{rb}, v_{lb} \geq$  for each  $r, l$  (where  $r = 1, 2, 3, \dots, R$  and  $l = 1, 2, 3, \dots, I$ )

Description:

$EB$  = efficiency on unit  $b$

$y_{rj}$  = quantity of *output*  $r$  produced unit  $j = 1, 2, \dots, N$

$x_{lj}$  = quantity of *input*  $l$  produced unit  $j = 1, 2, \dots, N$

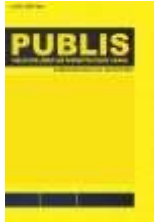
$u_{rb}$  = the weight given to *the output*  $R$  on the basis of unit  $B$

$v_{lb}$  = weight given to *input*  $l$  on the basis of unit  $b$

$e$  = very small positive number

(Source: Siti Fatimah and Umi Mahmudah, 2017)

The weights  $u$  and  $v$  are larger variables and constraints just like the numbers  $e$  (small positive) which aim to avoid arbitrary undefined inputs and outputs when determining efficiency. In trying to make the efficiency of each unit using linear program techniques. A DMU is declared efficient if its efficiency score is 1. Meanwhile, DMU is inefficient if the efficiency score is less than 1. In obtaining the solution of equation 1 it is necessary to convert it into the form of Linear Programming in equation 2.



Maximize

$$\sum_{r=1}^R u_{rb} y_{rb}$$

Constraint function

$$\sum_{i=1}^I v_{ib} x_{ib} = 1$$

$$\sum_{r=1}^R u_{rb} y_{rj} - \sum_{i=1}^I v_{ib} x_{ij} \leq 0$$

Atau

$$\sum_{r=1}^R u_{rb} y_{rj} \leq \sum_{i=1}^I v_{ib} x_{ij}$$

(Source: Siti Fatimah and Umi Mahmudah, 2017)

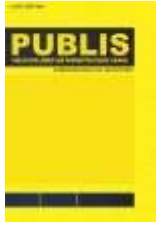
## Theoretical Studies

### 1) Efficiency

The Data Envelopment Analysis (DEA) approach can be used to measure efficiency in library operations. Efficiency refers to the relationship between the number of units of output per unit of input (Ramírez-Valdivia et al., 2015). The efficiency of a Decision Maker Unit (DMU) is said to be the ratio of output to input. The DEA certainly considers inputs or outputs to maximize the ratio. After measuring efficiency with DEA analysis, the examined journals will be proposed for rankings, while for inefficient journals suggestions will be made to improve efficiency. This action will increase the output of each journal (Petridis et al., 2013).

### 2) Data Envelopment Analysis (DEA)

This study, which focuses on the link between input and output variables with a Data Envelopment Analysis (DEA) approach, measures efficiency in the library science journal SINTA 2 and 3. A non-parametric LP (Linear Programming) model



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called DEA is used to measure productivity and efficiency. DEA was initially

employed as a performance measurement tool in the 1970s, and it is still expanding today (Ji & Lee, 2010). The DEA model's underlying premise is that various organizations or decision-making units can be contrasted. The number of inputs and outputs for each of these DMUs is the same, and some of them are found to be efficient while others are found to be inefficient (Rosenthal & Weiss, 2017).

The variables affecting each library's relative effectiveness are identified using Data Envelopment Analysis (DEA) methodologies. DEA evaluates the relative effectiveness of a Decision-Making Unit (DMU) or collection of DMUs that use comparable inputs and outputs. To make sure that all efficient DMUs have a score that is equal to one another, in DEA, efficient DMUs will obtain a score of 1, and inefficient DMUs will receive a score less than 1 (Lam, 2015).

In the evaluation process that will later produce results from the data obtained, DEA has several ways of optimizing approaches to measure the efficiency of data, namely:

Consistent Re-visitation of Scale (CRS) is a model created by Charnes, Cooper, and Rhodes in 1978. This model can be deciphered as the proportion between the expansion of info and result is something very similar, for instance in the event that there is an expansion of contribution by twice, the result should likewise increment by twice.

$$Efficiency = \frac{Input\ addition\ load}{output\ addition\ load}$$

$$Efficiency = \frac{u_1 \cdot y_{1j} + u_2 \cdot y_{2j} + \dots + u_n \cdot y_{nj}}{v_1 \cdot x_{1j} + v_2 \cdot x_{2j} + \dots + v_m \cdot x_{mj}}$$

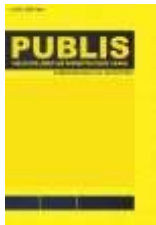
Description:

$u_i$  = load from the output  $i$

$y_{ij}$  = Sum of outputs  $i$  for units  $j$

$x_{ij}$  = The sum of inputs  $i$  for units  $j$

$v_i$  = Load from input  $i$



(Source: Dusan Teodorovic and Milos Nikolic, 2021)

The subsequent model is the Variable Re-visitation of Scale, created by Banker, Charnes, and Cooper in 1984. This model can be assumed that the number of increases between output and input is not the same, the result is that if we add output by 2 times, it will not affect the number of outputs or output does not have to increase by 2 times.

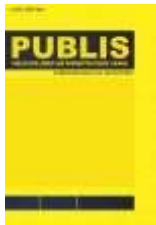
Furthermore, in the third model, the Malmquist Index Productivity, the quantity of the Malmquist Index is often used for measuring changes in productivity. Malmquist (1953) defined it as the number of vertically calculated consumption bundles. In the DEA technique, the Malmquist file can be utilized as a proportion of changes in the efficiency of a DMU. Changes in DMU can be said to be good if it can use inputs efficiently in producing a good / service. However, if the Malmquist Index value is smaller than one, it can be concluded that DMU has decreased productivity. This can be caused by two possibilities: a change in efficiency or a change in technology (Grifell-Tatje & Lovell, 1995).

The fourth model is Slacks-based-measure, this technique is reasonable for estimating the proficiency of results and info information when there is an unbalanced change. Using this model, we can find out the overall efficiency of DMU data (Tone & Tsutsui, 2009).

### **3) Bibliometric**

Bibliometrics is one of the branches of science in the library field that is used to determine the characteristics of a publication such as the Garuda journal – Garba Digital Reference (kemdikbud.go.id). Bibliometrics was first introduced in 1969 by Pritchard. Bibliometric methods can examine matters related to a scientific publication such as the efficiency of input-output values, the level of collaboration, the level of productivity, and the number of citations using mathematical and statistical analysis facilitated by software (Rohanda, 2019).

#### **H-index and h5-index**



The number of citations with the greatest H-index are in journals (Braun et al., 2013). The H-index is used to compare researchers, scientific journals, research groups and research institutions, and countries. While according to (Garfield, 1998) the h5 index, or the impact factor of keeping a 5-year diary, is that if you count the total number of papers published over a five-year period that have been cited in a given year.

#### **Impact factor**

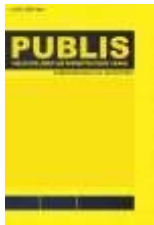
Impact factor (IF) is an indicator of the bibliometric method, which plays an important role in determining the final impact through the variables used. Impact factors were first written about in 1995 by Eugene Garfield in a scientific journal. When calculating the impact factor, it takes the number of citations and the number of articles published over a certain period (Kumar, 2018).

#### **4) Sinta**

SINTA journal is a database managed by the Indonesian Ministry of Science, Technology, and Higher Education, or Kemenristekdikti, that contains accredited Indonesian scientific journals. This database is a source of information used by research and development stakeholders.

SINTA is considered an international global directory that is equipped with various functions such as citation, which shows Scholar and Scopus h-index per year; networking, which is a feature that can show scholars related to a topic; and research output, which is a feature that includes articles (Suryaningsum et al., 2020).

Using SINTA allows you to quickly and easily use reference sources and comprehensively measure the performance of Indonesian researchers, institutions, and electronic journals (Saputra, 2020). According to (Ahmar et al., 2018), By using SINTA, lecturers can easily see the contribution of various research institutions to the existence of documents indexed in Scopus and Google Scholar.



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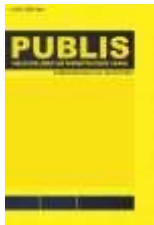
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### RESULTS

This DEA research is an approach used to obtain results or efficiency scores of library science, information science, and documentation study journals indexed by Sinta 2 and 3 in the period of 5 years, 2018–2022, using the DEAP 2.1 application as a tool in carrying out calculations. If the efficiency score of an efficient DMU will be given an efficiency score of 1 or TE (technical efficiency), Meanwhile, inefficient DMUs will be given an efficiency score of less than 1, so that all efficient DMUs have the same efficiency score.

**Table 4:** Efficiency Calculation Results  
(Source: Excel processed data author, 2023)

Journal	Impact Factor	H5-Index	Number of Publications	Number of Authors	Technical Efficiency
Khazanah Al-Hikmah: Jurnal Ilmu Perpustakaan, Informasi, dan Kearsipan	1,00	18	89	217	0.949
Jurnal Berkala Ilmu Perpustakaan dan Informasi	0,68	14	64	159	1
Baca: Jurnal Dokumentasi dan Informasi	6,47	11	92	201	1
Jurnal Kajian Informasi dan Perpustakaan	2,68	19	70	170	1
Lentera Pustaka: Jurnal Ilmu Perpustakaan, Informasi, dan Kearsipan	0,96	9	64	132	0.61
Record and Library Journal	0,30	12	120	254	0.423
EduLib: Journal of Library	4,49	9	89	215	0.563



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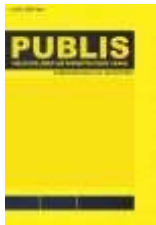
Pustakaloka: Jurnal Kajian Informasi dan Perpustakaan	8,27	14	78	136	1
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Based on the results of calculations carried out in the journals of library science, information science, and documentation studies indexed by Sinta 2 and 3 using the DEAP Version 2.1 application, it was found that 4 journals were declared efficient. The statement can be seen from the table above that in Sinta 2, there are 3 journals, namely the Journal Berkala Ilmu Perpustakaan dan Informasi, Jurnal Baca: Jurnal Dokumentasi dan Informasi, and Jurnal Kajian Informasi dan Perpustakaan. And in Sinta 3, there is one journal that is declared efficient, namely the journal Pustakaloka: Jurnal Kajian Informasi dan Perpustakaan. The journal can be said to be efficient with the results of TE (technical efficiency), namely 1. While the other 4 journals were declared inefficient because they got TE results below 1.

Based on research using the DEAP version 2.1 application, researchers calculated three calculations using the DEAP application. In the first calculation, there are 3 journals on each count through the DEAP application, namely Khizanah Al-Hikmah Jurnal Ilmu Perpustakaan, Informasi, dan Kearsipan. The average efficiency value of the three journals is 0.983, but there are only two efficient journals, namely the Jurnal Berkala Ilmu Perpustakaan dan Informasi with an efficiency value of 1.00 and Baca: Jurnal Dokumentasi dan Informasi with a value of 1.00, while the Khizanah Al-Hikmah Journal obtained a value of 0.949. Khizanah Al-Hikmah Journal is in the inefficient category but has a very high value. The difference is very little to reach a value of 1.00. (Petridis et al., 2013).

In the second calculation, researchers counted three journals using the DEAP application, namely the Journal of Information and Library Studies, Lentera





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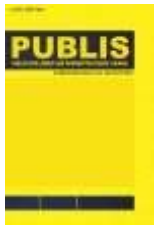
Pustaka: Jurnal Kajian Ilmu Perpustakaan, Informasi, dan Kearsipan. The average value of the efficiency of the three journals is 0.678, but there is only one journal that has an efficient value, namely the Journal of Library and Information Science Studies with an efficiency value of 1.00, while the Lentera Pustaka Journal has an efficient value of 0.610 and the Record and Library Journal gets a value of 0.423.

In the last calculation using the DEAP version 2.1 application, researchers calculated the last 2 journals, namely the journals Edulib: Journal of Library and Information Science and Pustakaloka: Jurnal Kajian Informasi dan Perpustakaan. The average efficiency value of the two journals is 0.782. Jurnal Edulib obtained an efficiency of 0.563, while Jurnal Pustakaloka obtained an efficiency value of 1.00.

### **DISCUSSION**

Publishing a work in a reputable or accredited journal can enable it to get high citations. This is in accordance with the results of the study that the Sinta journal has a high efficiency value, so it has the opportunity to get high citations. Discussions related to reputable journals have also been presented in previous studies. The number of article citations is an important strategy to achieve nationally and internationally accredited journals. However, getting a high number of citations is also influenced by the accreditation of the journal that publishes the article. (Ridho Aulianto et al., 2019). One factor that indicates the success of a journal in providing usefulness of published works is the number of authors who cite from the journal. The better the accreditation of a journal, the greater the number of citations. (Ridho Aulianto et al., 2019) In research conducted for lecturers in publishing their work in reputable journals, the level of publishing scientific work is very productive until those who cite in their scientific work are high until the h-index reaches 14, and the highest level of citation from one of the authors is up to 854 citations. (Maya & Sarbini, 2023).

The high number of citations indicates that the authors have made significant



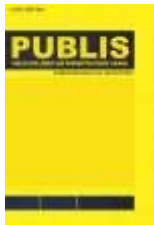
contributions to academia through publications in reputable journals, such as the journal BACA, which has a citation rate of 30 (Aulianto & Nashihuddin, 2020). The quality of an article's content is also affected by the number of citations it receives in the journal. A study revealed that articles with a high number of citations have better content than articles with a large number of pages but poorer content. (Nugroho, 2022)

## CONCLUSIONS

This study aims to identify journals that are efficient and inefficient. This study uses the Data Envelopment Analysis (DEA) methodology to examine the relationship between input and output relationships in library science journals Sinta 2 and Sinta 3. This study has inputs in the form of the number of authors and the number of publications, and outputs in the form of impact factors and H5-Index. The goal of this study is to comprehend how input factors associated to library science journals, such the quantity of authors and publications, influence the results, like the impact factor and H-5 Index. By comparing each entity to those that are best at utilising their inputs to produce similar outputs, the DEA framework is used to quantify entity efficiency. Using the DEAP application, it is to determine that a journal with a calculation value of 1 is efficient. Sinta 2 consists of the journal Berkala Ilmu Perpustakaan dan Informasi, Baca: Jurnal Dokumentasi dan Informasi, Jurnal Kajian Informasi dan Perpustakaan. Sinta 3 consists of Pustakaloka: Jurnal Kajian Informasi dan Perpustakaan. For future research, the authors suggest that researchers submit journals to several journals that have an efficient value calculation of 1. Journals have a high impact factor, so it is possible to be cited in the work is also high.

## REFERENCES

- Abramo, G., D'Angelo, C. A., & Pugini, F. (2008). The measurement of Italian universities' research productivity by a non-parametric-bibliometric methodology. *Scientometrics*, 76(2), 225–244.



<https://doi.org/10.1007/s11192-007-1942-2>

Adila, N. (2022). Implementation of Web Scraping for Journal Data Collection on the SINTA Website. *Sinkron*, 7(4), 2478–2485. <https://doi.org/10.33395/sinkron.v7i4.11576>

Ahmar, A. S., Kurniasih, N., Irawan, D. E., Sutiksno, D. U., Napitupulu, D., Setiawan, M. I., Simarmata, J., Hidayat, R., Busro, Abdullah, D., Rahim, R., & Abraham, J. (2018). Lecturers' Understanding on Indexing Databases of SINTA, DOAJ, Google Scholar, SCOPUS, and Web of Science: A study of Indonesians. *Journal of Physics: Conference Series*, 954. <https://doi.org/10.1088/1742-6596/954/1/012026>

Anand, A., Kringelum, L. B., Madsen, C. Ø., & Selivanovskikh, L. (2021). Interorganizational learning: a bibliometric review and research agenda. *The Learning Organization*, 28(2), 111–136. <https://doi.org/10.1108/TLO-02-2020-0023i>

Aulianto, D. R., & Nashihuddin, W. (2020). Bibliometrics And Citation Analysis Of “Baca : Jurnal Dokumentasi Dan Informasi” Published During 2015-2019. *Khazanah Al-Hikmah : Jurnal Ilmu Perpustakaan, Informasi, Dan Kearsipan*, 8(2). <https://doi.org/10.24252/kah.v8i2a5>

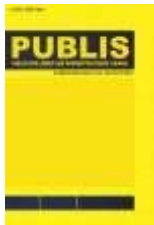
Baas, J., Schotten, M., Plume, A., Côté, G., & Karimi, R. (2020). Scopus as a Curated, High-quality Bibliometric Data Source for Academic Research in Quantitative Science Studies. *Quantitative Science Studies*, 1(1), 377–386. [https://doi.org/10.1162/qss\\_a\\_00019](https://doi.org/10.1162/qss_a_00019)

Braun, T., Glanzel, W., & Andras S, S. (2013). A Hirsch-type index for journals. *Scientometrics*, 69(1), 169–173. <https://doi.org/10.1007/s11192-006-01>

Campbell, K., W. Vick, D., D. Murray, A., & F. Little, G. (1999). Journal Publishing, Journal Reputation, and the United Kingdom's Research Assessment Exercise. *Journal of Law and Society*, 26, 470–501. <https://doi.org/10.1111/1467-6478.00137>

Chen, K., Ren, X. T., & Yang, G. L. (2021). A novel approach for assessing academic journals: Application of integer DEA model for management science and operations research field. *Journal of Informetrics*, 15(3), 101176. <https://doi.org/10.1016/j.joi.2021.101176>

Chen, K., Yang, G., & Khoveyni, M. (2017). Measuring Performance Evolution of Academic Journals in Management Science and Operations Research: A DEA-Malmquist Approach. *Journal of Management Science and Engineering*, 2(1),



34–54. <https://doi.org/10.3724/SP.J.1383.201002>

Cooper, W. W., Seiford, L. M., & Zhu, J. (2011). Data Envelopment Analysis: History, Models, and Interpretations. In *International Series in Operations Research and Management Science* (Vol. 164). Springer New York LLC. [https://doi.org/10.1007/978-1-4419-6151-8\\_1](https://doi.org/10.1007/978-1-4419-6151-8_1)

Durieux, V., & Gevenois, P. A. (2010). Bibliometric Indicators: Quality Measurements of Scientific Publication. *Radiology*, 255(2), 342–351. <https://doi.org/10.1148/radiol.09090626>

Evans, J. R., Foster, S. T., & Linderman, K. (2014). A content analysis of research in quality management and a proposed agenda for future research. In *Quality Management Journal* (Vol. 21, Issue 2, pp. 17–44). American Society for Quality. <https://doi.org/10.1080/10686967.2014.11918383>

Fatimah, S., & Mahmudah, D. U. (2017). Data Envelopment Analysis (DEA): Pengukuran Efisiensi Kinerja Sekolah Dasar. *Cakrawala Pendidikan*, 2, 233–243. <https://doi.org/10.21831/cp.v36i2.11511>

Garfield, E. (1998). Long-term vs. short-term journal impact: does it matter? *The Physiologist*, 41(3), 113–115. <http://www.ncbi.nlm.nih.gov/pubmed/9652169>

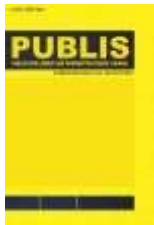
Giraldo, P., Benavente, E., Manzano-Agugliaro, F., & Gimenez, E. (2019). Worldwide Research Trends on Wheat and Barley: A Bibliometric Comparative Analysis. *Agronomy*. <https://doi.org/10.3390/agronomy9070352>

Glänzel, W. (2006). On the opportunities and limitations of the H-index 1. *Science Focus*, 1(1), 10–11.

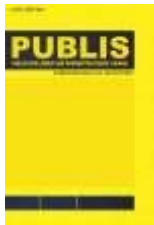
Grifell-Tatje, & Lovell, C. A. K. (1995). A note on the Malmquist productivity index. *Economics Letters*, 47, 169–175. [https://doi.org/10.1016/0165-1765\(94\)00497-P](https://doi.org/10.1016/0165-1765(94)00497-P)

Harzing, A.-W., & Van Der Wal, R. (2009). A Google Scholar H-Index for Journals: An Alternative Metric to Measure Journal Impact in Economics & Business. *Journal of the American Society for Information Science and Technology*, 60(1), 41–46. <https://doi.org/10.1002/asi.20953>

Ji, Y.-B., & Lee, C. (2010). Data envelopment analysis. *The Stata Journal*, 10(2), 267–280. <https://doi.org/10.22004/ag.econ.152313>



- Kumar, A. (2018). Is "Impact" the "Factor" that matters...? (Part I). In *Journal of Indian Society of Periodontology* (Vol. 22, Issue 2, pp. 95–96). Medknow Publications. [https://doi.org/10.4103/jisp.jisp\\_195\\_18](https://doi.org/10.4103/jisp.jisp_195_18)
- Lam, K. F. (2015). In the determination of the most efficient decision making unit in data envelopment analysis. *Computers and Industrial Engineering*, 79, 76–84. <https://doi.org/10.1016/j.cie.2014.10.027>
- Lee, H., & Shin, J. (2014). Measuring journal performance for multidisciplinary research: An efficiency perspective. *Journal of Informetrics*, 8(1), 77–88. <https://doi.org/10.1016/j.joi.2013.10.004>
- Maya, R., & Sarbini, M. (2023). Analisis Publikasi Ilmiah Dosen STAI Al-Hidayah dalam Profil Google Scholar. *Khidmatul Ummah: Jurnal Pengabdian Kepada Masyarakat*, 4(1).
- Miemczyk, Joe., Johnsen., & Macquet, Monica. (2012). Sustainable purchasing and supply management: a structured literature review of definitions and measures at the dyad, chain and network levels. *Supply Chain Management: An International Journal*, 17(5), 478–496. <https://doi.org/10.1108/13598541211258564>
- Nugroho, P. A. (2022). Publikasi Terindeks Scopus Oleh Pustakawan Indonesia, Apakah Jumlah Halaman Mempengaruhi Potensi akan Sitasi? *THE LIGHT: Journal of Librarianship and Information Science*, 2(2), 60–66.
- Petridis, K., Malesios, C., Arabatzis, G., & Thanassoulis, E. (2013). Efficiency analysis of forestry journals: Suggestions for improving journals' quality. *Journal of Informetrics*, 7(2), 505–521. <https://doi.org/10.1016/j.joi.2013.02.002>
- Ramírez-Valdivia, M., Maturana, S., Mendoza-Alonzo, J., & Bustos, J. (2015). Measuring the efficiency of chilean primary healthcare centres. *International Journal of Engineering Business Management*, 7. <https://doi.org/10.5772/60839>
- Renjith, & Vijayan, S. S. (2017). Journal's Self Citations and its Impact on h5 index of Library and Information Science (LIS) Journals of Prominent Countries: A Statistical Analysis Based on Journal Scholar Metrics. *International Journal of Library and Information Studies*, 7(4). <http://www.ijlis.org>
- Ridho Aulianto, D., Yusup, P. M., & Setianti, Y. (2019). Pemanfaatan Aplikasi "Publish Or Perish" Sebagai Alat Analisis Sitasi Pada Jurnal Kajian Komunikasi Universitas Padjadjaran. *Seminar Nasional MACOM III Universitas*



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[https://www.researchgate.net/publication/334812404\\_Pemanfaatan\\_Aplikasi\\_Publish\\_Or\\_Perish\\_Sebagai\\_Alalat\\_Analisis\\_Sitasi\\_Pada\\_Jurnal\\_Kajian\\_Komunikasi\\_Universitas\\_Padjadjaran?enrichId=rgreq-2c7a00eb53a110912d77e5d9ec0452d5-XXX&enrichSource=Y292ZXJQYWdlOzMzNDgxMjQwNDtBUzo3ODY4NjMyNDU3Nzg5NDRAMTU2NDYxNDIyNTYyOA%3D%3D&el=1\\_x\\_2&\\_esc=publicationCoverPdf](https://www.researchgate.net/publication/334812404_Pemanfaatan_Aplikasi_Publish_Or_Perish_Sebagai_Alalat_Analisis_Sitasi_Pada_Jurnal_Kajian_Komunikasi_Universitas_Padjadjaran?enrichId=rgreq-2c7a00eb53a110912d77e5d9ec0452d5-XXX&enrichSource=Y292ZXJQYWdlOzMzNDgxMjQwNDtBUzo3ODY4NjMyNDU3Nzg5NDRAMTU2NDYxNDIyNTYyOA%3D%3D&el=1_x_2&_esc=publicationCoverPdf)

Rohanda. (2019). Analisis Bibliometrika Tingkat Kolaborasi, Produktivitas Penulis, Serta Profil Artikel Jurnal Kajian Informasi &. *PUSTABIBLIA: Journal of Library and Information Science*, 3(1). <https://doi.org/10.18326/pustabiblia.v3i1.1-15>

Rosenthal, E. C., & Weiss, H. J. (2017). A data envelopment analysis approach for ranking journals. *Omega (United Kingdom)*, 70, 135–147. <https://doi.org/10.1016/j.omega.2016.09.006>

Saputra, A. (2020). Pemanfaatan Science and Technology Index (SINTA) untuk Publikasi Karya Ilmiah dan Pencarian Jurnal Nasional Terakreditasi. *Media Pustakawan*, 27 (1). <https://doi.org/10.37014/medpus.v27i1.674>

Suryaningsum, S., Purwanto, S. H., Kusumastutik, B., & Tanjung, R. W. (2020). *Strategi Universitas Meraih Nilai Tinggi Untuk Jurnal Terakreditasi Dalam SINTA*. 4(1), 73–79. <https://doi.org/http://dx.doi.org/10.30595/jssh.v4i1.6144>

Teodorović, D., & Nikolić, M. (2021). *Measuring scientific output of researchers by t-index and Data Envelopment Analysis*. <https://doi.org/10.48550/arXiv.2107.05376>

Tone, K., & Tsutsui, M. (2009). Network DEA: A slacks-based measure approach. *European Journal of Operational Research*, 197(1), 243–252. <https://doi.org/10.1016/j.ejor.2008.05.027>

Xu, T., You, J., Li, H., & Shao, L. (2020). Energy Efficiency Evaluation Based on Data Envelopment Analysis: A Literature Review. *Energies*, 13(14). <https://doi.org/10.3390/en13143548>