

---

AI translation · View original & related papers at  
[chinaxiv.org/items/chinaxiv-202308.00494](https://chinaxiv.org/items/chinaxiv-202308.00494)

---

## Impact Evaluation of Library and Information Science Journals from the Perspective of Knowledge Exchange Efficiency (Postprint)

**Authors:** Zhang Quan, Zhang Yanhua, Wang Chengjun

**Date:** 2023-08-27T00:00:00+00:00

### Abstract

[Purpose/Significance] This paper constructs a journal influence evaluation method from the perspective of knowledge exchange efficiency to provide reference for exploring multi-dimensional indicator evaluation and optimization of journal influence. [Method/Process] The DEA model is utilized to measure the knowledge exchange efficiency of library and information science journals. Based on efficiency differences among journals and the principles of the DEA method, recognition relationships among journals are identified, a recognition network is constructed, and the  $\alpha$ -centrality of each node is calculated to represent journal influence. The relative strength values of journal indicators and their classification results are employed to reveal the causes of journal influence, and the knowledge source redundancy rate and dissemination/citation deficiency rate of journal knowledge exchange are measured. [Results/Conclusion] Library and information science journals demonstrate relatively high overall knowledge exchange efficiency, yet differences exist. According to their influence magnitude, journals are positioned in the central, core, and peripheral areas of the journal recognition network, with the total number and degree of recognition from other journals decreasing sequentially. Journals are classified into six types: academic hotspot, knowledge diffusion, network dissemination, domestic influence, international influence, and improvement-oriented, with few international influence-type journals. Improvement-oriented journals need to reduce the knowledge source redundancy rate and dissemination/citation deficiency rate to enhance journal efficiency. Suggestions for enhancing journal influence are proposed.

## Full Text

### Preamble

**Authors:** Zhang Quan<sup>1,2</sup>, Zhang Yanhua<sup>2</sup>, Wang Chengjun<sup>1</sup>

<sup>1</sup>School of Management, Xi'an University of Architecture and Technology, Xi'an 710055

<sup>2</sup>School of Economics and Management, Xi'an University of Posts and Telecommunications, Xi'an 710121

### Abstract

**[Purpose/Significance]** This paper proposes a novel journal impact evaluation method from the perspective of knowledge exchange efficiency, providing a reference for exploring multi-dimensional indicator evaluation and optimization of journal impact. **[Method/Process]** The study employs DEA models to measure the knowledge exchange efficiency of library and information science journals, identifies recognition relationships among journals based on efficiency differences and DEA methodology principles, constructs a recognition network, and solves for each node's alpha centrality to represent journal influence. It also reveals the causes of journal impact using relative strength values of journal indicators and their classification results, and calculates the redundancy rate of knowledge sources and the deficiency rate of dissemination and citation in journal knowledge exchange. **[Result/Conclusion]** Library and information science journals demonstrate relatively high overall knowledge exchange efficiency but with notable differences. Based on impact magnitude, journals occupy central, core, and peripheral positions in the journal recognition network, with both the total number and degree of recognition from other journals decreasing accordingly. Journals are classified into six types: academic hotspot, knowledge diffusion, network communication, domestic impact, international impact, and improvement-oriented types, with relatively few journals of the international impact type. Improvement-oriented journals need to reduce knowledge source redundancy rates and dissemination/citation deficiency rates to enhance efficiency. The paper concludes with recommendations for improving journal impact.

**Classification Number:** G353

**Keywords:** library and information journals; DEA; knowledge exchange efficiency; impact power; alpha centrality; journal type

Academic journal impact refers to the ability of researchers to disseminate knowledge and experience—such as academic viewpoints, theories, and methods—through journal articles in order to gain recognition and utilization from others, manifested as the capacity to influence or even change their thinking, perspectives, and behaviors. Scientifically evaluating academic journal impact is therefore crucial for assessing scientific achievements, research talent, and innovative development. For a long time, scholars have used citation levels of journal ar-

ticles to measure academic value. Consequently, domestic and international research has predominantly employed bibliometric methods based on citation statistics to evaluate journal impact. However, single indicators, while intuitively reflecting citation patterns, overlook or underweight the sensitivity of citable literature volume relative to citation volume. To address this limitation, T. Braun et al. borrowed J.E. Hirsch's H-index concept for evaluating scientific achievements and proposed the journal H-index, where a journal has index  $h$  if  $h$  of its papers have at least  $h$  citations each. This method's drawback is that the H-index is positively correlated with publication duration and volume, disadvantaging newer journals and those with fewer but high-quality, highly-cited papers. C.T. Bergstrom et al. subsequently introduced the Eigenfactor Score, which weights inter-journal citation networks using citation impact factors and solves for each journal's eigenvector centrality to represent influence, addressing the problem of treating all citations as equal in single metrics and the H-index.

Nevertheless, single indicators fundamentally reflect journal impact from only one perspective. Therefore, recent scholarship has increasingly adopted multi-dimensional evaluation methods, including Analytic Hierarchy Process, Principal Component Analysis, Factor Analysis, and Grey Relational Analysis. However, these approaches have limitations: AHP relies on expert-assigned weights, while PCA and factor analysis assume normal distributions, reducing objectivity and scientific rigor. The trend clearly favors multi-dimensional evaluation.

The process from article publication to subsequent citation essentially constitutes a multi-input, multi-output knowledge exchange system. Journal impact evaluation should therefore simultaneously consider both citable literature volume and citation metrics, essentially reflecting the ability to maximize citation counts (domestic and international) from existing citable literature. This is precisely what knowledge exchange efficiency captures. Since DEA (Data Envelopment Analysis) offers advantages—requiring no specific functional form, being dimensionless, and handling multi-input/multi-output systems—domestic scholars widely employ it for journal impact evaluation. However, traditional DEA models cannot distinguish among multiple efficient DMUs nor explain the causes of journal impact, making it difficult to provide improvement directions for inefficient journals.

This paper addresses these limitations by combining DEA with complex network theory. First, it measures the knowledge exchange efficiency of 26 library and information science journals and analyzes inter-journal efficiency differences. Second, it constructs an inter-journal recognition network based on efficiency differences, solves for each node's alpha centrality to represent influence, and explains impact causes through relative strength values and classification results. Finally, it calculates knowledge source redundancy rates and dissemination/citation deficiency rates to provide improvement strategies.

## 2. Research Design

To address the discrimination problem when DEA models yield multiple efficient DMUs, this study adapts J.S. Liu's network DEA model, treating each DMU as a node (journal). Each DMU's weight coefficient  $\lambda$  represents the recognition relationship strength from decision unit  $k$  to  $j$ , forming an  $n \times n$  adjacency matrix ( $n$  = number of journals). A weighted directed edge from node  $k$  to node  $j$  represents this recognition relationship, enabling alpha centrality calculation for impact measurement.

### 2.1 Journal Knowledge Exchange Efficiency Measurement Model

Assume  $n$  journals, each with  $m$  knowledge source input indicators  $x$  ( $i = 1, \dots, m$ ) and  $s$  knowledge dissemination/citation output indicators  $y$  ( $r = 1, \dots, s$ ). Using the DEA-VRS (Variable Returns to Scale) model, we calculate knowledge exchange efficiency for journal  $k$  as shown in Model (1):

$$\begin{aligned} \text{Min } & \theta_k \\ \text{s.t. } & \sum_{j=1}^n \lambda_{jk} x_{ij} + s_i^- = \theta_k x_{ik}, \quad i = 1, \dots, m \\ & \sum_{j=1}^n \lambda_{jk} y_{rj} - s_r^+ = y_{rk}, \quad r = 1, \dots, s \\ & \sum_{j=1}^n \lambda_{jk} = 1, \quad \theta_k, \lambda_{jk} \geq 0 \end{aligned}$$

In Model (1),  $\lambda$ ,  $s^-$ , and  $s^+$  represent journal  $k$ 's weight coefficient, slack variables for knowledge source indicators, and surplus variables for knowledge dissemination/citation indicators. When  $\theta_k = 1$  and  $s^- = s^+ = 0$ , journal  $k$  is efficient; when  $\theta_k < 1$ , it is inefficient. The redundancy of knowledge source indicator  $i$  for journal  $k$  is  $\Delta x_i = (1 - \theta_k) x_{ik} + s_i^-$ , and the deficiency of dissemination/citation indicator  $r$  is  $\Delta y_r = s_r^+$ .

### 2.2 Journal Recognition Network Construction and Impact Measurement

For robustness, we partition indicators into  $t$  combination types and solve  $w = (2 - 1)(2 - 1)$  independent DEA models to avoid bias from weight concentration on specific indicators. The efficiency for DMU  $k$  under type  $t$  is calculated via Model (2):

$$\begin{aligned}
 & \text{Min } \theta_k^t \\
 & \text{s.t. } \sum_{j=1}^n \lambda_{jk}^t x_{ij}^t \leq \theta_k^t x_{ik}^t, \quad i = 1, \dots, m \\
 & \quad \sum_{j=1}^n \lambda_{jk}^t y_{rj}^t \geq y_{rk}^t, \quad r = 1, \dots, s \\
 & \quad \sum_{j=1}^n \lambda_{jk}^t = 1, \quad \theta_k^t, \lambda_{jk}^t \geq 0
 \end{aligned}$$

Here,  $\lambda_{jk}^t$  represents DMU  $k$ 's recognition degree of DMU  $j$  under indicator combination  $t$ . If  $\lambda_{jk}^t > 0$ , DMU  $j$  is a recognition target for DMU  $k$ , with magnitude indicating recognition strength;  $\lambda_{jk}^t = 0$  indicates no recognition.

To eliminate scale effects, we standardize  $\lambda_{jk}^t$ . Under DEA model type  $t$ , DMU  $k$ 's recognition degree of DMU  $j$  through input indicator  $i$  is:

$$IW_{t,k \rightarrow j}^i = \frac{\lambda_{jk}^t x_{ij}^t}{\sum_{j \in E_k} \lambda_{jk}^t x_{ij}^t}, \quad 0 < IW_{t,k \rightarrow j}^i \leq 1$$

where  $E$  is the set of DMUs recognized by DMU  $k$ . Similarly, for output indicator  $r$ :

$$OW_{t,k \rightarrow j}^r = \frac{\lambda_{jk}^t y_{rj}^t}{\sum_{j \in E_k} \lambda_{jk}^t y_{rj}^t}, \quad 0 < OW_{t,k \rightarrow j}^r \leq 1$$

The total recognition degree from DMU  $k$  to DMU  $j$  under type  $t$  is:

$$IOW_{t,k \rightarrow j} = \sum_{i=1}^m IW_{t,k \rightarrow j}^i + \sum_{r=1}^s OW_{t,k \rightarrow j}^r$$

Summing across  $w$  types yields adjacency matrix  $A$ , where  $A_{jk}$  represents DMU  $k$ 's total recognition of DMU  $j$  (diagonal elements are zero). The corresponding network topology  $G(A)$  forms a recognition network based on efficiency differences. Node alpha centrality, representing journal impact, is calculated as:

$$I = \alpha \times A \times I + e$$

where  $\alpha = 0.05$  (constant) and  $e$  is a column vector of ones. Each component  $I_j$  in solution vector  $I$  represents DMU  $j$ 's alpha centrality (impact value), reflecting both the quantity and degree of recognition from other DMUs.

### 3. Empirical Results Analysis

Each journal is treated as a DMU. Input indicators are: (1) Citable documents—total citable articles published in the statistical year after excluding non-citable items like reprints, news, photos, announcements, and introductions; (2) Average references per article—reflecting knowledge source quality. Output indicators are: international citations per article, citing journal count, Web immediacy downloads, immediacy citations, and domestic citations per article. International citations per article reflect global academic impact; domestic citations per article reflect national impact; citing journal count indicates knowledge exchange breadth; Web immediacy downloads and immediacy citations reflect short-term dissemination.

Data were obtained from CNKI’s “Chinese Academic Journal International and Domestic Impact Statistical Analysis Database.” After excluding journals with missing data, 26 library and information science journals were selected, with 2014-2016 indicators averaged to ensure objective efficiency measurement.

#### 3.1 Journal Knowledge Exchange Efficiency

Using DEAP 2.0 software to solve Model (1), the 2014-2016 knowledge exchange efficiencies are shown in Table 1 .

**Table 1** shows that the mean efficiency is 0.96538, indicating high citation and dissemination efficiency with active knowledge flow. Seventeen journals (65.38%) achieve optimal efficiency ( $= 1$ ), including *Chinese Journal of Library Science*, *Journal of Academic Libraries*, and *Library and Information Service*. *New Century Library* has the lowest efficiency at 0.81286. The presence of multiple efficient journals with varying efficiency levels necessitates constructing a recognition network based on these differences to reveal true journal influence.

#### 3.2 Journal Impact Analysis

Through 45 DEA model variants and visualization using Pajek’s Kamada-Kawai algorithm, the recognition network  $G(A)$  is shown in Figure 1 [Figure 1: see original paper].

**Figure 1** reveals a network of 26 nodes (journals) with 242 directed edges representing recognition relationships. Network density is 0.32923, indicating moderate recognition activity. Central positioning signifies superior knowledge exchange and peer recognition. *Chinese Journal of Library Science* occupies the center; *Information Science*, *Library and Information Service*, and *Journal of the China Society for Scientific and Technical Information* occupy core positions, receiving 841, 334, 432, and 627 recognition instances respectively. Recognition intensity exceeds 30 for twelve journals acknowledging *Chinese Journal of Library Science*, with *Library Research* showing the highest recognition at 47.08.

Alpha centrality scores, calculated via Model (7), are presented in Table 2 . *Chinese Journal of Library Science* ranks first (306.60), followed by *Informa-*

tion Science (106.07), *Library and Information Service* (102.53), and *Journal of the China Society for Scientific and Technical Information* (101.37). Thirteen journals have centrality below 100, with *New Century Library* ranking lowest. Nearly all influential journals are CSSCI core collection titles; only *Journal of Academic Libraries* among non-CSSCI journals shows modest impact (4.26). This reflects differential knowledge exchange patterns and future trends, creating pressure and motivation for quality improvement.

### 3.3 Journal Strengths, Weaknesses, and Types

To explain impact differences, we calculate each journal's indicator relative strength. The comprehensive recognition degree of all journals toward journal  $j$ 's indicator  $p$  is:

$$IOWS_p^j = \sum_{t=1}^w \sum_{k=1}^n IW_{t,k \rightarrow j}^i \quad (p = i) + \sum_{t=1}^w \sum_{k=1}^n OW_{t,k \rightarrow j}^r \quad (p = m + r)$$

Normalized relative strength is:

$$IO_p^j = \frac{IOWS_p^j}{\sum_{p=1}^{m+s} IOWS_p^j}$$

Results in Table 3 show average relative strength is highest for average references per article (0.1797) and citable documents (0.1363), indicating strong performance in paper depth and breadth. All dissemination/citation indicators fall below 0.1, particularly domestic citations per article (0.0611), suggesting suboptimal knowledge dissemination.

Using K-means clustering in SPSS 23 (converged after 3 iterations, with F-tests significant at  $p < 0.05$ ), journals are classified into six types (Table 4):

1. **Academic Hotspot Type** (*Library and Information Service*, *National Library Journal*, etc.): High relative strength in citable documents (0.2979), average references (0.2996), and immediacy citations (0.1634), reflecting rapid publication cycles and timely citation.
2. **Knowledge Diffusion Type** (*Journal of Intelligence*, *Library and Information Studies*): Strong in citable documents (0.3059), average references (0.1652), and citing journal count (0.3362), demonstrating cross-disciplinary knowledge spread.
3. **Network Communication Type** (*Information Theory and Practice*, *Chinese Journal of Library Science*): High citable documents (0.4550) and Web immediacy downloads (0.2219), indicating strong online dissemination.

4. **Domestic Impact Type** (*Journal of Academic Libraries, Information and Documentation Services*, etc.): Notable strength in average references (0.4014), citing journal count (0.1617), and domestic citations per article (0.1577), showing strong national influence.
5. **International Impact Type** (*Information Science, Journal of the China Society for Scientific and Technical Information, Library and Information Knowledge*): High average references (0.2751) and international citations per article (0.3286), reflecting global reach.
6. **Improvement-Oriented Type** (nine journals including *University Library Work, Information Exploration*): Low efficiency requiring targeted improvements.

### 3.4 Improvement Directions and Strategies

For inefficient journals ( $\theta < 1$ ), knowledge source redundancy indicates efficiency loss causes, while dissemination/citation deficiency indicates improvement targets. Redundancy and deficiency rates are calculated as:

$$\text{Redundancy Rate}_k^i = \frac{(1 - \theta_k) \times x_{ik} + s_i^-}{x_{ik}} \times 100\%$$

$$\text{Deficiency Rate}_k^r = \frac{s_r^+}{y_{rk}} \times 100\%$$

Results in Table 5 show *New Century Library* has severe citable document redundancy (-18.7%), followed by *University Library Work* (-18.1%). Excessive volume reduces article length and innovation, decreasing citation potential. *Digital Library Forum* shows highest reference redundancy (-67.64%), suggesting excessive self-citation or low-quality citations. Editors should require removal of invalid references and addition of authoritative recent literature.

Dissemination/citation deficiency rates reveal substantial improvement potential. *Digital Library Forum* has the highest Web immediacy download deficiency (1,164.89%), followed by *Modern Library and Information Technology* (90.52%). International citation deficiency is severe for *New Century Library* (186.02%), *Library* (106.88%), *University Library Work* (95.77%), and *Information Exploration* (71.80%). Domestic citation deficiency is notable for *Digital Library Forum* (139.49%), *Library Research* (119.22%), and *Library Theory and Practice* (69.57%). Immediacy citation deficiency is high for *Digital Library Forum* (72.93%) and *Modern Library and Information Technology* (33.36%). Citing journal count deficiency affects *Digital Library Forum* (129.74%) and *Library* (24.08%).

**Improvement strategies** for improvement-oriented journals include: (1) Adjusting publication volume and quality to achieve optimal citation levels; (2)

Enhancing international impact by translating excellent papers into English to overcome language barriers; (3) Strengthening network dissemination by shortening review cycles and expanding beyond CNKI platforms; (4) Broadening disciplinary scope to increase cross-field citations, particularly in emerging areas like big data analytics and artificial intelligence.

## Conclusion and Limitations

This study combines DEA-VRS with complex network theory to analyze 26 library and information science journals. Results show: (1) Multiple DEA-efficient journals exist with significant efficiency variation; (2) *Chinese Journal of Library Science*, *Information Science*, *Library and Information Service*, and *Journal of the China Society for Scientific and Technical Information* hold core network positions with strong influence; (3) Journals excel in knowledge source indicators but show weaknesses in dissemination/citation; (4) Six journal types are identified, with international impact types being rare; (5) Improvement-oriented journals must reduce redundancy and deficiency rates.

**Limitations** include: (1) Citation quality (e.g., source journal impact factors) is not considered; (2) External factors like publication delay are not quantitatively analyzed. Future research should incorporate citation quality metrics and external influence factors.

## References

- [1] Wu Junhong, Sun Xiukun, Sun Juan, et al. Comparative study on journal impact index and impact factor for evaluating international journals [J]. *Acta Editologica*, 2017, 29(5): 500-504.
- [2] Xu Haiyun, Fang Shu. Research on academic journal evaluation indicators based on citation distribution and citation networks [J]. *Information Science*, 2013, 31(2): 130-134, 139.
- [3] Braun T, Glänzel W, Schubert S. A Hirsch-type index for journals: The Scientist Magazine of the Life Sciences [J]. *The Scientist*, 2005, 19(22): 8.
- [4] Hirsch JE. An index to quantify an individual's scientific research output [J]. *Proceedings of the National Academy of Sciences*, 2005, 102(46): 16569-16572.
- [5] Bergstrom CT, West JD, Wiseman MA. The eigenfactor metrics [J]. *Journal of Neuroscience*, 2008, 28(45): 11433-11434.
- [6] Chen Ming. Construction of an open access journal evaluation model [J]. *Library and Information Service*, 2010, 54(14): 11-15.
- [7] Dong Minhong. Research on effectiveness of evaluation indicators for library and information core journals based on principal component analysis [J]. *Information Science*, 2010, 28(11): 1670-1672, 1678.
- [8] He Ying. Comprehensive evaluation of academic impact of Chinese management journals (2001-2004) [J]. *China Soft Science*, 2007, 32(1): 107-112, 133.
- [9] Yue Hongjiang, Liu Sifeng. Grey relational study on citation indicators of management science journals [J]. *Studies in Science of Science*, 2008, 26(1): 61-

65.

- [10] Yu Liping, Liu Aijun. Improved research on principal component and factor analysis in journal evaluation [J]. *Journal of Intelligence*, 2014, 33(12): 94-98.
- [11] Zhang Lei. Analysis of journal knowledge exchange efficiency and influencing factors: Based on DEA-Tobit two-stage method [J]. *Studies in Science of Science*, 2015, 33(4): 516-521, 615.
- [12] Li Lin, Huang Haijun, Wang Shouyang. Academic journal evaluation based on DEA/AR game cross-efficiency method [J]. *Journal of Management Sciences in China*, 2016, 19(4): 118-126.
- [13] Wang Hui, Wang Shuqiao. Evaluation and influencing factors of knowledge exchange efficiency of library and information journals [J]. *Information Science*, 2017, 35(3): 134-138, 156.
- [14] Wu Meiqin, Li Changhong, Song Yawen, et al. Journal citation efficiency evaluation based on window analysis and slack-based measure: Analysis of efficiency differences among 18 library and information journals [J]. *Information Theory and Practice*, 2017, 40(2): 122-127.
- [15] Liu JS, Lu WM. DEA and ranking with the network-based approach: A case of R&D performance [J]. *Omega*, 2010, 38(6): 453-464.
- [16] Banker RD, Charnes A, Cooper WW. Some models for estimating technical and scale inefficiencies in data envelopment analysis [J]. *Management Science*, 1984, 30(9): 1078-1092.
- [17] Wang Xiaozhen, Ji Shengbao, Dang Jianmin. Re-examination of strategic emerging industries based on improved network DEA: Cases of medical device and pharmaceutical industries [J]. *Journal of Shanxi University of Finance and Economics*, 2013, 35(5): 69-80.
- [18] Luo Jiade. *Lectures on Social Network Analysis* [M]. Beijing: Social Sciences Academic Press, 2010.
- [19] Nooy WD, Mrvar A, Batagelj V. *Exploratory Social Network Analysis with Pajek* [M]. New York: Cambridge University Press, 2005.
- [20] Kamada T, Kawai S. An algorithm for drawing general undirected graphs [J]. *Information Processing Letters*, 1989, 31(1): 7-15.
- [21] Bonacich P. Technique for analyzing overlapping memberships [J]. *Sociological Methodology*, 1972, 4(4): 176-185.
- [22] Bonacich P, Lloyd P. Eigenvector-like measures of centrality for asymmetric relations [J]. *Social Networks*, 2001, 23(3): 191-201.
- [23] Li Changling, Guo Fengjiao. Comparative study of several centrality analysis methods for disciplinary journal evaluation: Case of 19 library and information core journals [J]. *Journal of Intelligence*, 2013, 32(5): 115-120.
- [24] Lu Wendai, Zhu Hongbing. *SPSS Statistical Analysis* (5th ed.) [M]. Beijing: Electronic Industry Press, 2015.
- [25] CNKI. *Chinese Academic Journal International Citation Report* (2016 ed.) [R]. Beijing: China Academic Journal (CD-ROM) Electronic Publishing House, 2016.

## Author Contributions

**Zhang Quan:** Conceptualization, framework design, empirical analysis, manuscript writing.

**Zhang Yanhua:** Literature review, data collection, policy recommendations.

**Wang Chengjun:** Manuscript revision and supervision.

---

**English Title:** The Evaluation of Impact Power of Journals About Library and Information from the Perspective of Knowledge Exchanging Efficiency

**Authors:** Zhang Quan<sup>1,2</sup>, Zhang Yanhua<sup>2</sup>, Wang Chengjun<sup>1</sup>

<sup>1</sup>School of Management, Xi'an University of Architecture and Technology, Xi'an 710055

<sup>2</sup>School of Economics and Management, Xi'an University of Posts and Telecommunications, Xi'an 710121

**Abstract:** [Purpose/significance] From the perspective of knowledge exchange efficiency, this paper proposes a new evaluation method for impact power of journal and provides reference for exploring the multi-dimensional index evaluation and optimization for journal evaluation. [Method/process] Using DEA model to measure the knowledge exchange efficiency of library and information journal, based on the difference of efficiency and the principle of DEA method, the recognition relationship between journals was identified. Then the recognition network was constructed and  $\alpha$  center degree of each node to represent the influence of the journal was solved. Using relative strength value of journal indexes and its classification results, the causes of the journal impact power was revealed, and the redundancy rate of knowledge sources and the shortage rate of dissemination and citation was measured. [Result/conclusion] The overall knowledge exchange efficiency of library and information journals is high, but there are differences. According to the order of journal impact power, different journals are located at the center, core and edge of the recognition network, and in the same order, the degree of recognition declines accordingly. Journals are divided into six types: academic hotspot, knowledge diffusion, network communication, domestic influence, international influence and improving type. Journals of improving type need to reduce the redundancy rate of knowledge sources and the shortage rate of dissemination and citation to improve their efficiency.

**Keywords:** journals about library and information; DEA; knowledge exchange efficiency; impact power;  $\alpha$  center degree; journal type

*Note: Figure translations are in progress. See original paper for figures.*

*Source: ChinaXiv — Machine translation. Verify with original.*