Analysis and Evaluation of Academic Influence for Sci-Tech Books in China by Multiple Dimensions

Junpeng Yuan[1, a] **,** Yu Zhang[2, b] **,** Mingyan Dong[1], Yaoyue Liu[1] **,** Ganqi Lu[1] **,** Zhao Shi[1] and Guohua Jiang[1]

[1]Qi Fang Education Research Institute, Xi'an International University, Xi'an 710077, China;

[2] Medical Library of the Chinese PLA, Beijing 100039, China.

[a]junpengyuan@126.com, [b]zhangyu3417@126.com

Keywords: evaluation of books; academic influence; multiple dimensions; scientometrics

Abstract. On the basis of the present development of the book evaluation research, the article develop an informative and comprehensive evaluation system by combining with the feature of real data, such as the traditional paper books, e-books and network book reviews, so as to evaluate the academic influence of the books in the medical field. The empirical analysis showed that Sci-Tech books present the long-tailed distribution, and that foreign language translated books are highly influential. The results also showed the effectiveness of evaluation system.

1. Introduction

Scholarly books and monographs play a significant role in research communication, providing important scientific review in some disciplines and the latest research for others [1]. Book publication of China has made great progress in varieties and quantities ranking the first in the world, more than 440,000 books were published Nationwide in 2013[2]. How to select and make use of them has been an urgent issue for readers and librarians to solve. Therefore, book evaluation is an indispensable part in the course of book publication, utilization and network communication.

At present, the main qualitative analysis of book evaluation is book reviews and expert assessment method. In the objective analysis of book evaluation, Mostly carry out research using Google Book Search Angle abroad [3], Thomson Reuters pushed out book citation index (BkCI) in 2012 [4]. In China, Ye Jiyuan in Nanjing University proposed firstly developing Chinese books citation index-Humanities Social Sciences (CBkCI) in 2005 [5]. Peking University carried out the project of "the research of Chinese books evaluation" [2]. In the book evaluation model, some study from a single point, such as PDCA cycle models, RFM models [6, 7].Through above, we can see that these methods all have their own biases, only focusing on the journal citation, or relies on the publication's list of books, or lack of standardized, reliable sources of data.

With the development of network and electronic information technique widely used in scientific research activities recently, electronic and digital publishing has become the trend, journals citation databases has been well established,, book citation database is just over the horizon, electronic library, online bookstore and its evaluation system is growing, those brings new opportunity for academic influence of multi-dimensional book evaluation. On the base of studying the affecting factors, the Chinese S&T Evaluation System is constructed in order to carry out the academic influence book evaluation applying to overall subjects and type from the perspective of multidimensional angle it combines with the feature of real data and provide benefit lessons and enlightenments for book evaluation.

2. Academic Influence Evaluation of Book

It is necessary to analysis academic influence factors for ensuring the evaluation index scientifically and constructing evaluation system. Academic influence evaluation of book contains the quantitative evaluation and qualitative evaluations. Specifically, the following factors should be taking into account: the subject, the type, book citation, funding, awards, online book reviews, book reviews, the hits, downloads, print of electronic library, library collections, and book lending, and so on. This paper proposes four dimensions of book evaluation system according to different levels of

academic influence and constructs academic influence evaluation system combines with classification and type (see Table 1).

Table 1 the Chinese S&T Academic influence Evaluation System

First class	second class	third class
	cited in CSTPCD	total citation
		average citation
citation	Cited in Google Scholar	total citation
		average citation
	publishing fund	the National Science and Technology Fund
		the National Press Foundation
funds and award		the Ministry Published Fund
	award-winning	Chinese Publishing Awards
		the Chinese Outstanding Publication Award
		three one hundred original books
Online book review	Joyo Amazon	star ratings
		comments number
	dangdang	star ratings
		comments number
	Collection and borrowing of print books in professional library	Collection
		total borrowing
		average borrowing
		copy
		loan rate
utilization of book	Collection and borrowing of electronic library	Collection
		hit
		download
		print
	Edition and impression	Edition
		impression
	sale	Total sale
		Average sale

(First class spanning column: Academic influence Evaluation)

3. Empirical Analysis on the Academic influence Evaluation of Sci-Tech Books in China

According to the principles and methods above mentioned, we take the books of basic medicine, clinical medicine, and pharmacy from 2008~2012 as examples for empirical analysis of evaluation system. Eventually we obtain the most influential academic books in those subject and type.

(1) Determine the weight coefficients of indicators

Determining the weight coefficients of indicators is one important aspect of book evaluation. We give the relative importance of factors through marking the objects in a range by 1~9 sign method based on investigating the experts' suggestions and type. Driven by the great importance of funding and awarding, we single out funding and awarding and setting up weight coefficient 1.other weight factors are affirmed by AHP. The weight of each index results are shown (see Table 2).

Table 2 Academic influence Evaluation System of Sci-Tech Books in China

First class	second class	third class	weight
	cited in CSTPCD	total citation	0.143
		average citation	0.143
citation	Cited in google Scholar	total citation	0.107
		average citation	0.107
	publishing fund	the National Science and Technology Fund	1
		the National Press Foundation	1
funds and award		the Ministry Published Fund	1
	award-winning	Chinese Publishing Awards	1
		the Chinese Outstanding Publication Award	1
		three one hundred original books	1
Online book	Joyo Amazon	star ratings	0.06
		comments number	0.05

(First class spanning column: Academic influence Evaluation Of monograph)

review	Dangdang	star ratings	0.06
		comments number	0.05
utilization of book	Collection and borrowing of print books in professional library	Collection	0.025
		total borrowing	0.014
		average borrowing	0.011
		copy	0.018
		loan rate	0.018
	Collection and borrowing of electronic library	Collection	0.02
		hit	0.023
		download	0.027
		print	0.027
	Edition and impression	Edition	0.03
		impression	0.03
	sale	Total sale	0.02
		Average sale	0.016

(2) Data Sources and Access Methods (see Table 3).

Table 3 Data Sources and Access Methods of Indexes

indexes	Data sources	access methods
total citation	Google Scholar	Web Query
average citation		Calculate the result of Google Scholar
total citation	CSTPCD	Statistic by CSTPCD
average citation		Calculate the result of CSTPCD
star ratings	amazon.cn dangdang.com	Web Query
comments number		
the National Science and Technology Fund	website	Web Query
the National Press Foundation		
the Ministry of Health Published Fund		
Chinese Publishing Awards	website	Web Query
the Chinese Outstanding Publication Award		
three one hundred original books		
Collection	Medical Library of the Chinese PLA Library of Peking Union Medical College The Health Science Library of Peking University	query From the corresponding library management system
total borrowing		
average borrowing		
copy		
loan rate		
Collection	SuperStar Corp	queryfrom Superstar electronic library
hit		
download		
print		
Edition	CIP	field of CIP
impression		
Total sale	Open book	Sales Data of Open book
Average sale		

(3) Data Cleansing

After being collated and analyzed, the data was matched to CIP. There are 15937 books evaluated through rejecting null and correcting the wrong data.

4. Results

The research takes the books of basic medicine, clinical medicine, and pharmacy from 2008-2012 as examples for empirical analysis of evaluation system based on scientific measurement method. There are 15779 books in the three subjects, including basic medicine books 4098, clinical medicine books 9411, and pharmacy books 2428.

On the basis of different subject and type, we rank the evaluation results according to their score, from most to least. The results are shown in Fig.1- Fig.3 Books have fat-tailed distributions and of a few of them is high-impact in the head of the curve. With decreasing in value, the curve sudden drops. Majority of books has less of an impact. The level of them is pretty close. This explanation fits the facts that majority of books go unnoticed.
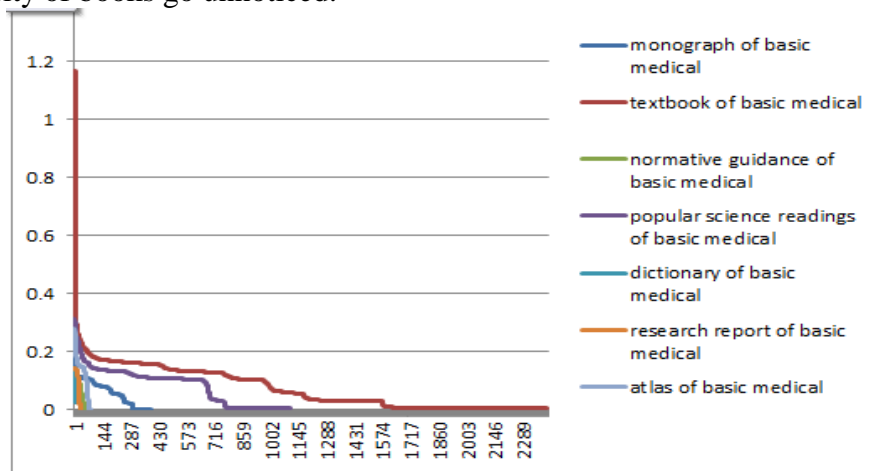

Fig. 1 Distribution of different type in basic medicine according to their score
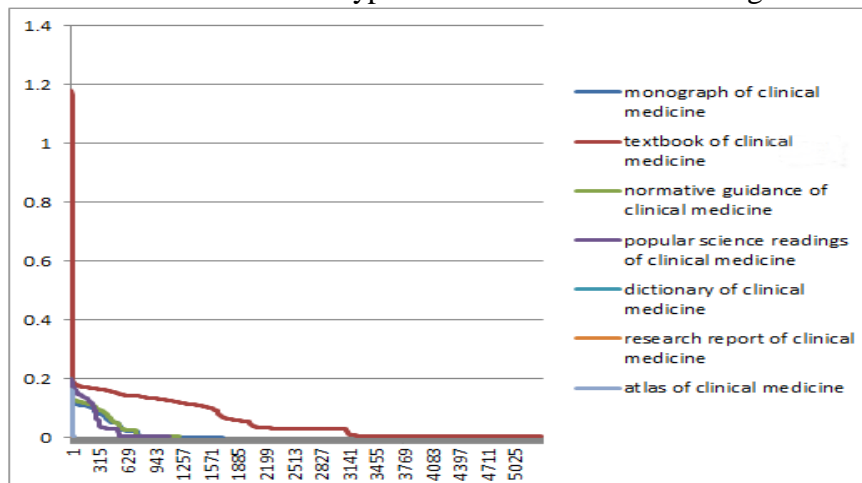

Fig. 2 Distribution of different type in clinical medicine according to their score
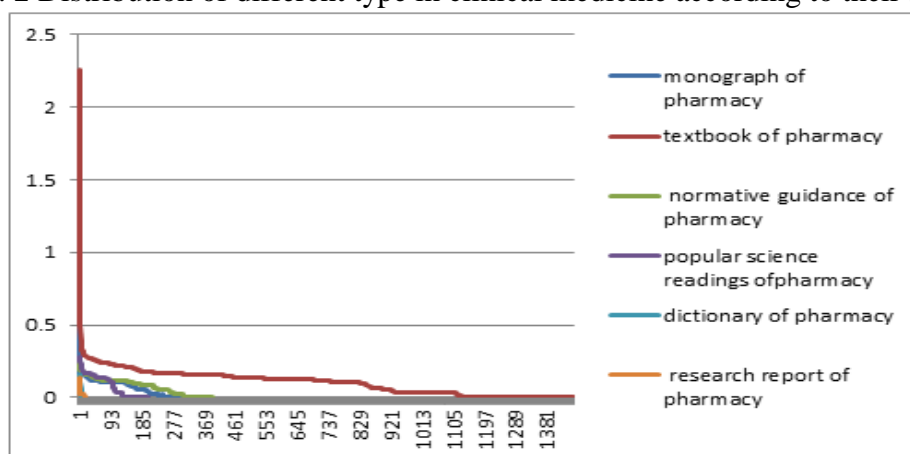

Fig. 3 Distribution of different type in pharmacy according to their score

5. Conclusion

On the basis of the present development of the book evaluation research, the article combines with the feature of real data, such as digital reading popular, diversified development of book, and synthesizes the traditional paper books, e-books and network book reviews, an informative and

comprehensive evaluation system has been set up, so as to evaluate the academic influence of the books in different categories from multiple dimensions and carried out the empirical analysis in the medical field. Those index data of basic medicine, clinical medicine, and pharmacy are collected and standardized, then are imported into the evaluation model and get the final results, we sort the result according to different type and obtain evaluation ranking. The evaluation results show that:

(1) Foreign language books translated version is highly influential, the home is attach great importance to foreign language books.

(2) Those are a greater difference between the head of the curve and others in top of monograph and textbook, differences among other type are relatively smaller.

Academic influence evaluation of book is an arduous and complicated task; the evaluation objects are colorful, high disparities, wide range, difficulty in statistics and lack of adequate data. the purposes of this article is to make an objective, rational and scientific evaluation by objective analysis ,combines with the feature of real data .It provides benefit lessons and enlightenments for academic influence evaluation of Chinese S&T books.

6. Acknowledgment

7. References

[1]. J. P. Yuan, Y. Yang, Y. T. Pan, and Y. S. Wu. 2013. "A Citation Analysis on Monographs in the Field of Scientometrics, Informetrics and Bibliometrics in China (1987-2010)," in the 14th International Society for Informetrics and Scientometrics, Vienna, pp.1887-1888.

[2]. J. He. 2012. "An Analysis on Book Evaluation Research in China," Journal of Academic Libraries, (3):106-110.

[3]. K. Kousha, M. Thelwall. 2009. "Google Book Search: Citation Analysis for Social Science and the Humanities," Journal of the American Society for Information Science and Technology, 60(8):1537–1549.

[4]. J. Gorraiz, P. J. Purnell, and W. Glanzel. 2013. "Opportunities for and Limitations of the Book Citation Index," Journal of the American Society for Information Science and Technology, 64(7):1388-1398.

[5]. J. Y. Ye. 2013. "The Innovation Significance and Enlightenment of the Database of Chinese Book Citation Index (CBkCI) Research & Development," Journal of Academic Libraries, (1):48-53.

[6]. H. Y. Zhang. 2012. "The Book Evaluation System Based on RFM Model of Library," Library, (3):60-62.

[7]. Y. L. LI, X. H. Sun, and J. B. Chen. 2013. "Exploration of 5-D Books Evaluation System and Construction of Analysis Model," Information Science, 31(8):77-80,140.