信息资源管理的理论与实践

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第一篇　中国图书馆学信息学研究之文献计量研究 [①]

程焕文

A Bibliometric Study of
Library and Information Research in China

Cheng Huanwen

1. INTRODUCTION

This paper analyzes formally published journal articles in library and information science (LIS) in China from 1985 to 1994. The aim of this paper is to study: (1) how the research articles are distributed over various topics; (2) what research methods were applied; (3) what the similarities and differences between LIS research in China and that in the world are (especially at the international level). Such an analysis reveals the foci of LIS research in China, their coherence, changes, neglected areas, the similarities and differences of between LIS research in China and abroad. Such a study contributes to a better understanding of what LIS in China is and how it may evolve.

Up to now, various contact analyses of LIS research publications have been made by many scholars around the world, such as Wersig, Neveling, Peritz, Nour, Schrader, Feehan, Gragg, Havener, Kester, Hauser, Atkins, Jarvelin, Vakkari, etc.. These content analyses of LIS research publications can be roughly divided into two types in several ways: One method distinguishes between analyses, analyzed samples published in

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the short term (generally in one year) and in the long term; these analyses can also be divided at the national and international levels; or in the comprehensive fields of LIS and in the limited fields of LIS. Although these studies have some deficiencies, they all contributed to the development of this research subject.

In the interests of continuity and comparability, this paper is mainly modeled on the research articles of two well – known scholars in this research field: Kalervo Jarvelin and Pertti Vakkari, in 1990[1], and 1993[2]. Because of different conditions in every country, the development of LIS research is different and uneven between developing countries and developed countries, even among countries at the same level of development. In this article, therefore, I will try to supplement or correct the research model of Jarvelin and Vakkari according to the real conditions of China.

In general, the content analysis model of Jarvelin and Vakkari consists of three parts: (1) the distribution of the articles over topics; (2) the approaches: viewpoints on information dissemination and social levels; and, (3) the methods: research strategies and data collection methods. It is difficult to identify the categories of the authors of LIS articles in China (i. e. whether they be librarians, producers, users, etc. .) and research strategies naturally reflect the chosen method of data collection. Therefore, when analyzing journal articles in LIS this paper only uses two parts of Jarvelin and Vakkari's model: (1) the distribution of the articles over topics, and, (2) the research strategy.

The data for this paper was collected from both research and professional articles (non – research – based articles) published in most of the core LIS journals in China. However, the aim of this paper is to study the research articles; thus, the professional articles are only analyzed as compared with the analysis of research articles in Section 3. 1.

2. METHODS

2. 1 The Classification Scheme

In general, there are two kind of methods used in designing classification schemes for content analyses of LIS articles. The first method designs the scheme completely on the basis of the articles used, like as Atkins did, or mainly on the basis of the articles used, such as Jarvelin and Vakkari did. The other method designs it on the basis of the essence of LIS. When using the first method, the classification scheme is created after analyzing

articles, and can only provide an overall picture of LIS research articles in a limited period but not an overall picture of LIS research. Therefore, it is unable to accurately reveal the overall situation of LIS research, especially its neglected areas. When using the second method, the classification scheme is created before analyzing articles, so it is able to accurately reveal the overall situation of LIS research. Even so, so far there has not been a detailed classification scheme of LIS research for this previously created type which is universally accepted throughout the world. Therefore, using the second method of classification, I will try to design a simplified LIS classification scheme (cf. Appendix B), based mainly of my understanding of the systematic structure of LIS, partly on the China Library Classification[3], partly on The Classification Scheme of Jarvelin and Vakkari in 1993, and partly on The Paper Index of Library, Information, Archive, Publication and Distribution Science (1949 – 1985)[4] and other similar indexes in China. The main classes of LIS topics are as follows:

10   the basic theory of LIS

20   library and information industry

30   education in LIS

40   information storage and preservation

50   information processes

60   information services

70   related disciplines

80   other LIS topics

90   other studies (other disciplines)

Every class contains subclasses (cf. Appendix B). Each article in my sample was classified into a single subclass. When an article had many topics, I tried to determine its main topic.

Because" research strategy is an overall approach to the study within which, for example, the decisions concerning data collection and the type of analysis are made"[5], the description of methods only includes research strategies (cf. Appendix B) but not data collection methods, types of analysis, or types of investigation. The list of possible research strategies consists of historical method, survey method, qualitative method, comparative method, logical method, bibliometric method, other mathematical method, concept analysis, experiment, literature review, other method, and not applicable (no method). Each article was also classified into one of these research strategy classes.

2. 2　The Data

Jarvelin and Vakkari verified in 1990 and 1993 that limiting data to journal articles may cause some bias in study results; however, it is generally true that even when a study is published as a monograph, it is at some point also reported in journals. Therefore, it is possible to make relatively reliable inferences concerning LIS research on the basis of journal articles. Because it is difficult to identify the publications which contain research fulfilling the criteria that determines what LIS research is, research publication in the field are ostensibly defined by choosing articles from the core scientific journals in LIS.

2. 2. 1　Periodization

The history of LIS research in China in modern times, namely in the 20th century, can be divided into six periods: (1) the embryonic period (1900 ~ 1924); (2) the rising period (1925 ~ 1937); (3) the period of decline (1938 ~ 1949); (4) the period of transformation (1950 ~ 1965); (5) the period of suspension (1966 ~ 1978); (6) the golden period (1979 ~). The golden period can be also divided into three phases: ① the recovery phase (1979 ~ 1985); ② the flourishing phase (1986 ~ 1990); and ③ the phase of further development (1991 ~). For my content analysis focused on the golden period, which is the most representative period of LIS research in China, due to its relative temporal proximity to the present and, its comparatively high state of development. I took the samples from the years 1985, 1990 and 1994 for the analysis, because these years represent the research peak of each phase in the period, and basically reflect the changes in LIS research that have taken place in China over the past 16 years.

2. 2. 2　Selection of journals

According to statistics from *A Guide to the Core Journals of China* (GCJC)[6], there were 92 LIS journals in China (the real number is 89, which excludes 3 repeatedly – counted journals), including 62 journals in library science (LS) and 30 in information science (IS), in 1992. According to statistical analysis[7], the GCJC selected a total of 32 core journals in LIS (the real number is 29, which excludes 3 repeatedly – selected core journals), including 19 core journals in LS and 13 in IS.

On the other hand, the Library Society of China (LSC) chosen 12, 9 and 12 excellent journals in LS from 72 journals in LS, respectively in the years 1989, 1993, and 1995, by all kinds of statistical figures and secret balloting of the members of the Editorial and Publishing Committee and Journal Research Group of LSC[8]. The 12, 9, and 12 excellent journals in LS of the years 1989, 1993, and 1995 are just among the top 12 of

the 19 core journals in LS selected by the GCJC (excepting 1 journal which was ranked 18th); these excellent journals from the years 1989, 1993, and 1995 have basically not changed (except for 1 journal). Therefore, I regard these 12 excellent journals of LS as the most representative core journals in LS research in China.

According to the above, 13 core journals out of 19 core journals in LS (which includes 12 excellent journals and 1 journal which was ranked fifth on the list of 19 core journals), and 10 core journals out of 13 core journals in IS (3 core journals in IS were repeatedly selected in 13 the core journals in LS), were selected for the study. Therefore, the study samples contain altogether 23 journals (cf. Appendix A). At the time of collecting the source data, altogether the 9 volumes from the 23 journals were not available, for various reasons.

2.2.3　Selection of articles and the basis of analysis

From the journals selected, I included only full – length articles in the sample. Like Javelin and Vakkari, I excluded editorials, letters to the editor, newslike reviews, personal and conference news, and advertisements. All the materials which were analyzed were whole articles.

3.　FINDINGS

The samples comprise 1930, 2447, and 2665 articles published in the core LIS journals respectively in the years 1985, 1990, and 1994, as indicated in Table 1.

Table 1.　Division of the source data among article types of 1985, 1990, and 1994

Article type	1985		1990		1994	
	Number	%	Number	%	Number	%
Research articles	986	51	1475	60	1560	59
Professional articles	944	49	972	40	1105	41
Totals	1930	100	2447	100	2665	100

In the three yearly data subsets, the proportion of research articles was above 50%, and the proportion of research articles in the last two yearly data subsets increased by nearly 10% over the year 1985, This finding is consistent with the conclusions of Jarvelin and Vakkari in their 1990 and 1993 studies, namely, that proportion demonstrates the

effectiveness of this purposive selection of articles, and that the share of research articles has grown.

3.1 The Distribution of Research Articles over Topics

3.1.1 The distribution of the articles over the main classes of LIS topics (Table 2).

Table 2. Topic distribution among main classes in the research articles
in 1985, 1990, and 1994

Topics	AR	1985			1990			1994		
		R	N	%	R	N	%	R	N	%
The basic theory of LIS	1	1	254	25.7	1	470	31.9	1	431	27.7
Infor. service	2	2	243	24.7	2	369	25	2	314	20.1
Related disciplines	3	3	186	18.9	3	180	12.2	5	160	10.3
Infor. process	4	4	113	11.4	5	140	9.5	4	222	14.2
Lib. & infor. industry	5	5	94	9.5	6	98	6.6	3	234	15
Infor. storage & preserve.	6	6	41	4.2	4	151	10.2	6	107	6.9
Education in LIS	7	7	29	2.9	7	45	3	7	60	3.8
Other study	8	8	22	2.2	8	15	1	8	24	1.5
Other LIS topic	9	9	4	0.4	9	7	0.5	9	8	0.5
Totals			986	99.8		1475	99.9		1560	100

Legend: AR = average ranked; R = ranked, N = numbers.

The 9 topics were arranged in average ranked order.

The Table 2 shows that the largest body of the articles in each year pertained to the basic theory of LIS (25.7% -31.9%); the second largest was Information service (IS, 20.1% - 25%). Their shares of the total increased steadily from 1985 to 1990 but decreased in 1994, a timeframe which corresponds exactly with the division of the three phases of the golden period of LIS research in China (Section 2.2.1). The proportion of these two largest groups in my study was nearly identical to that of the study of Jarvelin and Vakkari in 1993: that the largest body of articles belonged to the category of information

storage and retrieval (IS & R, 26.2% − 32.4%), and the second largest was library and information service activities (L & ISA, 25.4% − 27.2%). The second largest group (IS) in my research was also identical with that (L & ISA) of the study of Jarvelin and Vakkari. However, the main class of the largest (the basic theory of LIS) was completely different from that (IS & R) of the study of Jarvelin and Vakkari. The differences demonstrate the differences between LIS research in the western world and in China; that is, the tradition of LIS research in China focuses mainly on the study of so − called pure LIS theory, and in the western world on the study of L & I practice.

The shares and proportion of the third largest group (related disciplines) decreased steadily, which shows that, the traditional disciplines, such as documentation, book history, bibliography, and textual criticism, are still as important today in China they have been historically. These decreasing trend is due to a rise in other research fields of LIS after 1980s.

The shares of information process and L & I industry from each year seemed quite stable, which demonstrated that the two main topics appeared to be gradually interesting to researchers.

On other topics there were considerably fewer articles. The shares of information storage and preservation (4.2% − 10.2%), education in LIS (2.9% − 3.8%), other study (1% − 2.2%), and other LIS topics (0.4% − 0.5%) were also relatively steady, although the shares of information storage and preservation sharply increased from 4.2% in 1985 to 10.2% in 1990 because of the nation − wide program of library collection survey around 1990. In contrast to the study of Jarvelin and Vakkari in 1993, namely, that the growth of " other LIS topics" from 1% in 1965 to 10% in 1985 is remarkable and may indicate a gradual movement from traditional to new research topics in LIS in the world, the shares of " other LIS topics" was quite stable (0.4% − 0.5%) from 1985 to 1994 and may either indicate a basically stable structure of LIS research topics, or a small increase in new research topics in China.

3.1.2　The topic distributions in the subclasses

The subclasses of the top 4 main classes (Table 2) are analyzed as follows. The figures are drawn from Appendix C.

Within the basic theory of LIS, the most popular sub − fields have been studies of the principles of LIS (15.6% − 15.8% − 14.8%), and the principles of L& I management (4.3% − 7.3% − 5.5%). The branch disciplines of LIS (3.1% − 4% − 3.2%) and analyses of LIS (1.7% − 3.4% − 3.3%) appear to be more and more interesting to

researchers. Compared with the study of Jarvelin and Vakkari in 1993, the principles of L & I management was also one of the most popular sub – fields, and less attention is paid to methodology (1% –1.4% –0.9%).

Within information service, the most popular sub – fields have been studies of automated information retrieval (5.5% – 6.6% – 5.6%), the general theory of information service (2.9% – 5.3% – 4%), and reference service (4.1% – 4.6% – 2.8%). While the new topic of automated information retrieval has gained in popularity since 1985 (5.5% –6.6% –5.6%), the traditional topics of conventional information retrieval and circulation and readers' services have lost (2.1% –2% –1.3%, and 4.4% –1.2% – 1.3%). Studies of users and services have gradually increased (1.9% – 2.5% – 2.2%), whereas user education has gradually dropped (2.1% – 1.7% – 1.3%), less attention is paid to these two sub – fields. Library buildings and facilities has been a neglected area (1.1% –0.9% –1.2%).

Among analyses of related disciplines, the strongest emphases have been put on literature review (3.9% – 4.7% – 3.3%), book histories (5.1% – 3.7% – 2.1%), and bibliography science (6.9% – 1.9% – 2.4%), although the trend of these last two sub – fields is declining. Less attention has been paid to the most conventional sub – fields of documentation science (1.4% –0.6% –1.6%) and textual criticism (1.6% – 1.3% –0.9%).

In the category information process, classification and indexing (8.3% – 5.4% – 7.5%) and cataloguing (2.7% – 2.2% – 3.5%), as both basic and conventional information processes, have been the most popular sub – fields. Although both bibliographic database (0.4% – 1.6% – 1.9%) and non – bibliographic database (0% –0.3% – 1.3%) appear to be less interesting to researchers, clearly the trend is for them to increase, which indicates a gradual movement from traditional to new research topics.

3.2 Most frequent topics of research articles

The summary of the most popular topics of research articles in 1985, 1990, and 1994 is shown in average – ranked order as follows (Table 3).

It is clear that the principles of LIS was the most popular topic from 1985 to 1994, which further demonstrates the differences between LIS research in the western world and in China, namely, that much more attention is paid to the so – called pure theory of LIS in

China than in the western world.

Similar to the study of Jarvelin and Vakkari in 1993, there are clear trends: the proportion of classification and indexing has decreased, while the proportion of automated information retrieval has grown steadily. Classification and indexing, automated information retrieval, and information collection and storage are continuously among the most popular topics. Compared with the analysis results of Jarvelin and Vakkari in 1993, which concluded that publishing and book history were popular only in 1965 (the periodization was from 1965 to 1985), the conventional research topics in China of bibliography science, and book history were popular only in 1985. This may indicate that the movement from traditional to new research topics in LIS in China has lagged behind that of the western world by about 20 years.

Table 3. Summary on most popular topics in the articles in 1985, 1990, and 1994

Topics	AR	1985 (N=986)		1990 (N=1475)		1994 (N=1559)	
		R	%	R	%	R	%
The principles of LIS	1	1	15.6	1	15.8	1	14.8
Classification & indexing	2	2	8.3	5	5.4	3	7.5
Automated infor. retrieval	3	4	5.5	4	6.6	5	5.6
Infor. collection & storage	4	10	3.9	2	9.6	4	6.4
The principles of LI management	5	8	4.3	3	7.3	6	5.5
Lib. history in China	6	5	5.2	10	3.9	7	4.2
The general theory of infor. service	7	13	2.9	6	5.3	8	4
Literature review	8	11	3.9	7	4.7	11	3.3
Reference service	9	9	4.1	8	4.6	14	2.8
The branch disciplines of LIS	10	12	3.1	9	4	12	3.2
Book history	11	6	5.1	11	3.7	17	2.1
Bibliography science	12	3	6.9	17	1.9	15	2.4
Cataloguing	13	15	2.7	14	2.2	9	3.5
Analysis of LIS	14	20	1.7	12	3.4	10	3.3
Infor. industry in China	15	25	1.4	23	1.2	2	8.8
Circulation	16	7	4.4	24	1.2	22	1.3

Legend: the 16 topics were selected from the most popular topics in the top 10 ranks of each year, and arranged in average – ranked order.

Contrary to the analysis of Jarvelin and Vakkari in 1993, which stated that the analysis of LIS decreased popularity between 1965 and 1985, the analysis of LIS gradually

gained in popularity between 1985 and 1994 in China, which may also indicate that LIS research in China attaches major importance to the so – called pure theory of LIS.

It is well worth noticing that the share of information industry in China grew sharply from its original rank of the fifteenth (1.4%) in 1985 to the rank of second (8.58%) in 1994, which may show the great impact of " the information superhighway" on LIS research in China.

3. 3　Research strategies

The distribution of research strategies in the articles from the years 1985, 1990, and 1994 is shown in Table 4; the most popular research strategies are shown in Table 5.

Table 4. Research strategies in the articles in 1985, 1990, 1994

Research strategy	1985		1990		1994	
	N	%	N	%	N	%
Historical method	246	25	279	18. 9	283	18
Survey method	24	2. 4	59	4	25	1. 6
Qualitative method	48	5	106	7. 2	170	10. 9
Comparative method	25	2. 5	28	1. 9	52	3. 3
Logical method	94	9. 5	184	12. 5	76	4. 9
Bibliometric method	22	2. 2	88	5. 9	74	4. 7
Other mathematical method	127	12. 9	184	12. 5	191	12. 3
Concept analysis	155	15. 7	169	11. 5	166	10. 7
Experiment	3	0. 3	7	0. 5	4	0. 2
Literature review	38	3. 8	63	4. 3	48	3. 1
Other method	51	5. 2	95	6. 4	145	9. 3
Not applicable	153	15. 5	213	14. 4	326	20. 9
Totals	986	100	1475	100	1560	100

The most popular strategy in each year was historical method (25% – 18.9% – 18%). The study of Jarvelin and Vakkari in 1993 proved that, for a long time, historical method was the only scientific method for dealing with problems in the field; only in the beginning of 1950s it begin to lose ground. It is still a fairly strong tradition in LIS (the fourth most popular) in the western world. Although historical method has decreased

slightly in popularity, it is still the strongest in LIS in China, which indicates that historical method, the most conventional strategy, still plays a leading role in LIS research in China.

To LIS scholars in other countries, it is hardly conceivable that the second most popular research strategy in China was not applicable, or no method (15. 5% – 14. 4% – 20. 9%)! This unexpected finding indicates that many scaled researchers in LIS in China have not mastered the methodologies of scientific research, and many research articles have remained at a low level.

Table 5. Most popular research strategies in the articles
in 1985, 1990, and 1994

Research Strategies	AR	1985 (N = 986)		1990 (N = 1475)		1994 (N = 1559)	
		R	%	R	%	R	%
Historical method	1	1	25	1	18. 9	2	18
Not applicable	2	3	15. 5	2	14. 4	1	20. 9
Other mathematical method	3	4	12. 9	3	12. 5	3	12. 3
Concept analysis	4	2	15. 7	5	11. 5	5	10. 7
Logical method	5	5	9. 5	4	12. 5	7	4. 9
Qualitative method	6	7	5	6	7. 2	4	10. 9

Legend: The six strategies were selected from the most popular strategies in the top 5 ranks of each year, and arranged in average – ranked order.

What is surprising is that these findings are completely absolutely different from the analysis of Jarvelin and Vakkari in 1993, which found that the survey method was the most frequently used empirical strategy (22. 5% – 20. 3% – 22. 9%) in the western world; however, it has been very rarely used in China (2. 4% – 4% – 1. 6%). On the other hand, the qualitative method was very rare (0. 7% – 0% – 1. 6%) in the world, but it was frequently used in China (5% – 7. 2% – 10. 9%). These differences may indicate that much attention was paid to positive research in the western world, but that a considerably strong emphasis was put on uncritical theoretical research in China.

It is encouraging that this phenomena of the emphasis on uncritical theoretical research appears to be changing: the mathematical method, a new research strategy, rose in China in the early 1980s and is continuously among the most popular strategies. In

addition, the share of Bibliometric method has grown steadily (2.2% - 5.9% - 4.7%).

Similar to the study of Jarvelin and Vakkari in 1993, logic method and concept analysis are continuously among the most popular strategies, and experiments were extremely rare in the research articles (0.3% - 0.5% - 0.2%) as well.

3.4 The application of strategies on topic

Historical, not applicable, and mathematical strategies were, as a rule, the most popular strategies within the different topics (Table 6). The notable exceptions to this rule are the basic theory of LIS with not applicable and bibliometriic method, and information process with concept analysis, historical and other methods as the main strategies.

The three topics of the basic theory of LIS (22% - 17% - 29%), information service (27% - 24% - 28%), and other LIS topics (50% - 43% - 63%), are dominated by the not applicable strategy, which indicates that most researchers at lower levels are in these research fields.

The conventional topics of Library and information (68% - 60% - 41%), education in LIS (49% - 56% - 25%), and related disciplines (45% - 35% - 40%), are understandably dominated by the historical strategy.

In research on information storage and preservation, the use of strategies other than mathematical strategy, which was consistently the most frequent was completely different in each year of the study. In research on information processes, however, the frequent use of different strategies was in the stable order of concept analysis, historical, and other strategy.

4. DISCUSSION

The main finding from article samples from the years 1985, 1990, and 1994 is the remarkable similarity of the distributions. The largest study areas, in order of popularity, were the basic theory of LIS, information service, and related disciplines. In combination they covered over 60% of the research articles. The relative size of any other field of LIS was basically below 10%. All of these findings indicate that the foci of LIS have not changed greatly from 1985 to 1994 in China. On the other hand, the main fields of LIS research in China were different from those (IS & R, and L & I service activities) in the world, which suggests that LIS research in China focuses much on theory and history,