

A BIBLIOMETRIC ANALYSIS OF ASIAN AUTHORSHIP PATTERN IN *JASIST*, 1981-2005

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Introduction. This paper reports an analysis of Asian authorship characteristics and trends in *JASIST*. The investigation of the papers written by Asian scholars in this eminent international journal clearly reveals the productivity as well as co-authorship pattern of Asian researchers in information science.

Method. This study uses bibliometric method. It compiles 1,869 papers with 3,422 frequencies of authorship in *JASIST* from 1981 to 2005. The bibliographic records were exported from ISI *Web of Science* and complemented by the printed and electronic version of *JASIS* and *JASIST*.

Results. The findings show Asian researchers have considerably enhanced their influence especially since the period of 1996-2000, although English speaking countries are obviously dominant in *JASIST* articles.

Asian information science research has moved toward internationalization significantly since 2001, with the increase of the frequency of international co-authorship and the growth of collaborative countries. Among the investigated Asian countries, Japan is relative productively but had no collaborative work with non-Asian countries in *JASIST*. Japanese researchers tend to accomplish their studies individually or collaborated with other colleagues in the same country. Furthermore, this study finds that information technology related fields are the most commonplace backgrounds among these Asian scholars.

Conclusion. This study indicates that information science research in Asia has moved toward internationalization, and Asian researchers have made significant contributions to global information science study with their information technology related backgrounds.

Introduction

Since information science is regarded as Western domain, little is known about the role of Asian researchers in this field. Even though there were previous geographic studies in this field, most of them only focused on one or two countries or a limited area. Rarely have studies been conducted that explore the development of all of Asia. Furthermore, the topics of these Asian studies were mostly related to local history reviews or contemporary development in information science. Authorship and position analyses about Asian researchers have not been emphasized as much as those in the universal surrounding. Therefore, this study focuses solely on Asian researchers rather than all authors, thus revealing more about the characteristics of Asians' contributions in information science. It first investigates the productivity of Asian researchers in international journals, which gives a general indication of how many publications Asian researchers contribute to in this field. Then it analyzes the co-authorship between Asian and non-Asian researchers, indicating the foreign countries of scholars with whom Asian researchers coauthored and their positions in international collaboration. Finally, the study examined the professional and academic fields of Asian researchers who have collaborated with authors from outside Asia.

Bibliometric method is used in this study. Although various library and information science (LIS) journals have been analyzed by many bibliometric researchers to explore the nature and domain of this field (e.g. Buttlar, 1991; He & Spink, 2002; Raptis, 1992; Schloegl & Stock, 2004; Uzun, 2004), *Journal of the American Society of Information Science and Technology (JASIST)* is the most appropriate representative of international journals in information science. With a long history which starts on January 1950, *JASIST* experienced several changes in the number of volumes/issues, type of papers, editorial board, content scope, and even its title (Bates, 1999a; Smith, 1999). Two of the most remarkable historical events occurred in 1970 and 2001 respectively. Known as *American Documentation* before 1970, the journal changed its title from *Journal of the American Society of Information Science*

(*JASIS*) to *JASIST* in 2001. Despite those changes, *JASIST* still possessed a reputation among information scientists in the world and became the target journal for many studies. Many researchers even used *JASIST* for their bibliometric analyses (e.g. Al-Ghamdi et al., 1998; Bates, 1999b; Harter & Hooton, 1992; Koehler, 2001; Lipetz, 1999; Nisonger, 1999; Persson, 1994), since this journal is regarded as the exemplar of universal information science. To examine the research community of this journal, some of them further focused on the characteristics of authorship in *JASIST* articles. For example, Al-Ghamdi et al. (1998) conducted an analysis to investigate *JASIST* authorship and found that the number of female researchers, the number of collaborative articles, the number of foreign authors, and the number of authors affiliated with LIS schools all increased over the time span from 1970 to 1996. Some of their findings were also confirmed by Lipetz (1999), who demonstrated that international authors have become more common in *JASIST* and the number of authors with academic affiliations has particularly increased since the 1950s. Afterwards, He and Spink (2002) analyzed *JASIST* publication data and obtained results consistent with Lipetz's findings. It was shown that the number of foreign authors and the geographic locations have increased since the early 1980s. For the present study, data collection was restricted to the period beginning in 1981, since it has been shown that the proportion of international authors increased greatly after that time.

Despite numerous bibliometric analyses about *JASIS* done previously, the present study is still valuable in filling the gaps of earlier studies and strengthening their findings by compiling the complete information about authorship. For instance, He and Spink (2002) analyzed only the first authors of articles in their investigation of the geographic distribution of foreign authors. For the present study, however, data was collected on all authors of *JASIST* articles regardless of their order of authorship, thereby revealing the trends about information science research. Unlike Libetz's research (1999), which extracted a few issues from each time segment as a representative sample, all articles published in *JASIST* between 1981 and 2005 were collected for analysis in the present study. This paper furthermore explores the characteristics of authorship in more detail, such as the academic backgrounds of the authors.

Method

The bibliometric method was used to explore the internationalization of Asian information science research. In order to accurately reflect Asian researchers' academic positions and tangible contributions to this field, the bibliographic information of *JASIST* articles was collected as completely and accurately as possible. The principles of data collection and measures of this study are presented as follows:

Data Collection

As mentioned above, this study compiled *JASIST* articles between 1981 and 2005 in order to explore the authorship characteristics and trends of Asian scholars. Research papers, brief communications, historical notes, and opinion papers contributed by Asian information scientists, were collected for analysis, while editorials, book reviews, and European research letters were excluded. The bibliographic records were exported from ISI *Web of Science* and much effort was made to check the completeness of data and the accuracy of information about the authors (e.g. number of authors, order of authorship, authors' affiliations, and addresses) with the electronic version of *JASIS* and *JASIST* on the website *Wiley InterScience Journals* as well as printed materials.

Asian Information Scientists

Geographic locations of the information scientists were determined by the authors' addresses on *JASIST* articles at the time their works were published. Asian information science researchers were identified as the authors whose addresses were located in Asia, including Northeast Asia (China, Hong Kong, Japan, Korea, Macao, Taiwan), South and Southeast Asia (India, Malaysia, Singapore, Thailand), and West Asia (Bahrain, Israel, Jordan, Kuwait, Saudi Arabia, and Turkey), but excluding Russia and Croatia. With this definition, even authors of non-Asian nationalities whose addresses were in

Asia were considered Asian information scientists because presumably they used resources in Asia to conduct their work. Conversely, authors who were physically located outside Asia were not counted, regardless of nationality. Authors listed as having two addresses were included if at least one of their addresses was located in Asia. For example, an author with addresses in both China and Belgium was counted as a Chinese researcher in this study.

Author-related information

In order to further analyze the role of Asian scholars in information science research in Asia, some author-related data has been collected for this study, including the *Number of papers for each Asian country*, the *Frequency of authorship for each Asian country*, the *Frequency of co-authorship between Asian and non-Asian countries*, the *Number of papers by academic field*, and *Frequency of authorship by academic field*.

Results

There were three main findings in this study. The productivity of Asian information scientists in *JASIST* are shown first, followed by the comparison with that of non-Asian authors. Next, the co-authorship characteristics of Asian researchers were examined to determine the positions of Asian authors' in multinational joint works. Finally, the affiliations of Asian scholars were further analyzed to reveal their knowledge backgrounds and specialties in the transnational collaboration.

Productivity

This study collected 1,869 papers with 3,422 frequencies of authorship in *JASIST* from 1981 to 2005. 144 of the papers (7.70%) have total or partial contributions from 278 (8.12%) frequencies of Asian authorship, while 1,725 papers (92.30%) were completed written by 3,144 (91.88%) frequencies of non-Asian authors. Table 1 shows the distribution of number of papers and frequency of authorship by countries. It is obvious that there are more non-Asian countries (35) with published papers than Asian countries (16). English speaking countries, such as United States (1,249), Canada (114), and United Kingdom (112), are particularly dominant in *JASIST* publications for the past 25 years. Among Asian countries, Hong Kong had the most papers (25), followed by Israel (24), China (18), Taiwan (18), Japan (14), and Korea (14). No other Asian country contributed more than 6 articles.

In terms of authorship, Hong Kong and Israel had the most frequencies of authorship in *JASIST*, followed by Taiwan and China. When further calculating the average number of authors per paper, it is found that Israel, Japan, Malaysia, Singapore, and Taiwan all had more than two frequencies of authorship on average. These data show that information scientists of those countries tend to coauthor with other researchers for their publications in *JASIST*.

Table 1. The distribution of the number of papers and frequency of authorship in *JASIST* by countries.

Asia			Non-Asia	
Country	No. of papers	Freq. of authorship	Country	No. of papers (excluding collaborative works with Asians)
Bahrain	1	1	Australia	42
China	18	31	Austria	5
Hong Kong	25	49	Belgium	42
India	6	8	Brazil	5
Israel	24	49	Bulgaria	2
Japan	14	28	Canada	114
Jordan	5	8	Chile	3
Korea	14	15	Croatia	4
Kuwait	2	2	Denmark	12

Table 1. (Continued)

<u>Asia</u>			<u>Non-Asia</u>	
Country	No. of papers	Freq. of authorship	Country	No. of papers (excluding collaborative works with Asians)
Macao	1	1	Finland	15
Malaysia	2	6	France	20
Saudi Arabia	3	4	Germany	19
Singapore	8	22	Greece	1
Taiwan	18	42	Hungary	13
Thailand	2	3	Iceland	1
Turkey	5	9	Ireland	4
			Italy	18
			Mexico	1
			Netherlands	36
			New Zealand	6
			Nigeria	5
			Norway	5
			Poland	4
			Romania	1
			Russia	7
			Slovakia	1
			Slovenia	3
			South Africa	5
			Spain	26
			Sweden	7
			Switzerland	3
			United Kingdom	112
			United States	1,249
			Venezuela	1
			Yugoslavia	2
Total	148 (144 papers)	278	Total	1,794 (1,725 papers)

Note: The sum of the number of papers by each country is not equal to the total number of papers because international collaborative works are counted repeatedly.

Table 2 presents the trend of the productivity among Asian authors. As it shows, the frequency of Asian authorship in *JASIST* increased rapidly between 1996 and 2000 and achieved its highest period from 2001 to 2005. Although a possible explanation for this increase was due to the overall increase of *JASIST* issues (Al-Ghamdi et al., 1998), which were expanded from ten to twelve in 1996 and from twelve to fourteen in 1998, the similar extension before 1996 did not stir up a lot of publications by Asian authors. Hence, from the viewpoints of this study, the increase of the number of papers and the frequency of authorship can still be explained as an increase of Asian information scientists publishing more articles in this international journal.

In addition to the general trend of all Asian countries, Table 2 also shows the changes of productivity for each country over time. It is found that only three countries had publications in *JASIST* from 1981 to 1985. Most Asian countries, such as Hong Kong, Jordan, Macao, Malaysia, Singapore, Taiwan, and Thailand, did not have any *JASIST* articles in the 80s or early 90s. Among these countries, Hong Kong is most significant because it contributed no publications at all until 1996, and then made huge progress from 1996 to 2000, with 7 papers, and 18 papers from 2001 to 2005. China, Israel, and Taiwan had similar progress as well. It shows that Asian information scientists have become more visible in international journals like *JASIST* since the mid-1990s.

Table 2. The number of papers and the frequency of authorship by Asian country in *JASIST* per 5-year period, 1981-2005.

	1981-1985		1986-1990		1991-1995		1996-2000		2001-2005	
	No. of papers	Freq. of authorship	No. of papers	Freq. of authorship	No. of papers	Freq. of authorship	No. of papers	Freq. of authorship	No. of papers	Freq. of authorship
Bahrain			1	1						
China			2	2	1	1	5	6	10	22
Hong Kong							7	18	18	31
India	1	2	1	2	2	2	2	2		
Israel	5	5	1	2	1	1	6	9	11	32
Japan	4	6	1	7			4	4	5	11
Jordan							3	5	2	3
Korea			1	1	2	2	4	4	7	8
Kuwait			1	1					1	1
Macao									1	1
Malaysia							2	6		
Saudi Arabia					1	1	1	1	1	2
Singapore							1	4	7	18
Taiwan							5	11	13	31
Thailand									2	3
Turkey			1	1			1	1	3	7
Total	10	13	9	17	7	7	41	71	81	170

Co-authorship

Except for four papers coauthored by writers within Asian countries, most of the collaborative works of Asian researchers were intercontinental. As Table 3 shows, there are eight countries outside Asia which shared 35 joint papers with Asian ones. Among them, the United States had the most (27), accounting for over three quarters of the intercontinental collaboration. Even though this number may be due to the fact that the Americans contributed the majority of publications in *JASIST* (see Table 1), it still suggests that Asian information scientists had more scholarly interactions with researchers in the United States than with those in other countries.

Table 3. The frequency of co-authorship between Asian and non-Asian countries in *JASIST*.

	Australia	Belgium	Canada	Finland	Germany	Netherlands	UK	USA	Freq. of co-authorship	Number of papers
Bahrain										
China		1				1		2	4	4
Hong Kong	1				1		2	5	9	7
India								1	1	1
Israel		1		1			1	3	6	4
Japan										
Jordan								2	2	2
Korea	1							7	8	8
Kuwait										
Macao										
Malaysia										
Saudi Arabia								1	1	1
Singapore			2						2	2
Taiwan								1	1	1
Thailand								1	1	1
Turkey								4	4	4
Total	2	2	2	1	1	1	3	27	39	35

China, Hong Kong, India, Israel, Jordan, Korea, Saudi Arabia, Singapore, Taiwan, Thailand, and Turkey had co-authorship with countries in other continents. Among them, Hong Kong had the most intercontinental collaboration in terms of frequency of authorship, while Korea had the most in terms of number of papers published. However, in terms of the diversity of coauthors' locations, China, Hong Kong, and Israel had partners from the greatest number of different countries. They coauthored not only with Canada and the United States in North America, but also with the countries in Oceania and Europe, such as Australia, Belgium, Finland, Germany, and United Kingdom.

On the other hand, among the five countries which did not share authorship with non-Asians, Bahrain, Kuwait, and Malaysia are the only three which had no transnational collaborative works at all. Japan and Macao had co-authorship with China and Hong Kong, respectively. It is found that Japanese authors seem to prefer doing their research with other Japanese. In spite of higher rank in the number of papers (see Table 1), Japan had no collaborative work with non-Asian countries in *JASIST*. In the other word, researchers in Japan either accomplished their studies individually or collaborated with other colleagues in the same country.

The trend of collaboration between Asian and non-Asians researchers is shown in Table 4. Co-authorship, much like productivity, became more internationalized in Asia after 1996, based on this bibliometric analysis of *JASIST*. There were only a few intercontinental collaborative works from 1981 to 1995, mainly coauthored by researchers in the United States. Even though the frequency of co-authorship rose between 1996 and 2000, the extent of countries is still limited. Besides the United States, only Australia and Finland had had co-authorship with India and Hong Kong, respectively, at that time. However, the number of collaborative countries and the frequency of co-authorship increased significantly after 2001. It was the first time that Belgium, Canada, Germany, Netherlands, and United Kingdom became the partners of Asian authors in *JASIST*.

Table 4. The distribution of the number of papers coauthored by Asian and non-Asian countries in *JASIST* per 5-year period, 1981-2005.

	1981-1985 Country(Freq. of co-authorship)	1986-1990 Country(Freq. of co-authorship)	1991-1995 Country(Freq. of co-authorship)	1996-2000 Country(Freq. of co-authorship)	2001-2005 Country(Freq. of co-authorship)
Bahrain					
China				USA(1)	Belgium(1); Netherlands(1); USA(1)
Hong Kong				Australia(1)	USA(5); Germany(1); UK(2)
India			USA(1)	USA(2); Finland(1)	
Israel	USA(1)				UK(1); Belgium(2)
Japan					
Jordan				USA(2)	
Korea			USA(1)	USA(2)	USA(4); Australia(1)
Kuwait					
Macao					
Malaysia					
Saudi Arabia			USA(1)		
Singapore					Canada(2)
Taiwan					USA(1)
Thailand					USA(1)
Turkey		USA(1)		USA(1)	USA(2)
No. of country	1	1	1	4	7
Freq. of co-authorship	1	1	3	10	24

Affiliations

Analyses of productivity and co-authorship were conducted to learn the level of internationalization of Asian information science research. Investigation of authors' affiliations is helpful in examining what the advantages those Asian researchers have in this field. According to this study, almost 90% of Asian authors were affiliated with academia. Information technology and its related fields is the most notable background of academia. As Table 5 shows, over 40% of the authors' affiliations were related to computer science or information systems. However, the actual percentage may be much higher than this figure because many departments which used "information" as titles in Asia are particularly technical-oriented. For example, information science study in Taiwan is usually considered the equivalent of computer science. Besides, there is also large overlap between computer science and information management studies, and researchers in engineering may focus on computer hardware or information systems as well. Therefore it is obvious that information technology is the biggest strength of Asian researchers in global information science.

After computer science, library and information science is the second largest among the academic fields. Although not as common as computer science, over 10% of authors in this study had a background in library science. Thus, computer science and library and information science are apparently the two main fields of Asian researchers who contributed articles to *JASIST*. This finding is self-explanatory because the history of *JASIST* is closely related to the development of library and information science, and this journal changed its title by adding "technology" several years ago. Another probable reason is that the scholars of these two fields are the primary audience of *JASIST*. Nevertheless, researchers from other various fields have also contributed to *JASIST* since information science is an interdisciplinary study. On the other hand, despite low percentages, the traditional library and information science related fields such as education, management, business, and communication also have relatively more *JASIST* publications than some other special fields like geography, mathematics, physics, etc.

Table 5. The distribution of Asian authors' affiliations in *JASIST*.

Affiliation		No. of papers	Freq. of authorship (%)
Type	Fields		
Academia	Computer Science/Information System	55	118 (42.45%)
	Library and Information Science	29	36 (12.95%)
	Information Science	11	22 (7.91%)
	Library/Information Center	8	11 (3.96%)
	Engineering	8	9 (3.24%)
	Information Management	3	6 (2.16%)
	Education	3	5 (1.80%)
	Management	3	4 (1.44%)
	Business	3	3 (1.08%)
	Communication	2	2 (0.72%)
	Other or no data	20	28 (10.07%)
Government		8	10 (3.60%)
Private Sector		7	21 (7.55%)
N/A		3	3 (1.08%)
Total		163	278(100.00%)

Conclusion

By completing the bibliometric analysis of authorship information in *JASIST*, this study demonstrated several publication trends for Asian countries in information science research. According to the results, researchers from 16 Asian countries contributed 7.70% (144) papers and 8.12% (278) frequencies of authorship to *JASIST*. Even though authors from English speaking countries are obviously dominant in information science journal articles, based on this case study, it is found that Asian researchers have considerably enhanced their influence especially since the period of 1996-2000.

In addition to productivity in *JASIST*, the results of co-authorship analyses also demonstrated that the Asian information science research has moved toward internationalization since 2001. Both the frequency of international co-authorship and the number of collaborative countries increased during the 2001-2005 time period. It shows that among Asian researchers, there are not only more international coauthored papers, but also more countries with collaborating scholars. Asian researchers also have had joint authorship with the authors besides the United States, including Australia, Belgium, Canada, Finland, Germany, Netherlands, and United Kingdom. However, among these Asian countries, Japan is an exception since it was relatively productive but had no collaborative work with non-Asian countries in *JASIST*. Compared with the authors from other Asian countries, Japanese researchers accomplished their studies individually or collaborated with other colleagues in the same country.

Consistent with previous studies, this study found a much greater proportion of university affiliations than those of governments or the private sector. It was also found that computer science, information systems, and other information technology related fields are the most commonplace backgrounds among these Asian scholars. After integrating this result to the findings of the trend analysis (see Table 2), it can be declared that Asian researchers, with their technical backgrounds, have had more contributions to *JASIST* since 2001. It is hard to say whether the increase in the number of papers by Asians was because they made significant progress in information science research, or because *JASIST* merely attracted more computer science researchers after changing its title. This question could be answered by conducting similar analyses of other journals in the field and comparing the results.

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