

Analysis of Knowledge Productivity on Architecture: A Comparative Study on India and South Korea

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Abstract

The paper explores the knowledge productivity on Architecture with comparison of India and South Korea which is revealed in SCOPUS database. This study analyses the growth of research work and found that the mean RGR is 0.86 and realized about productivity of authors, the most prolific author is Yoo, H.J. with 126. When come institutional productivity Korea Advanced Institute of Science & Technology has stands first with 2607 publication. Then found that knowledge productivity is by India is more than South Korea i.e., 38807 over 23761, and India's growth rate of productivity is higher than South Korea on architecture literature.

Keywords: Knowledge Productivity, Architecture, Comparative study, India, South Korea, Relative Growth Rate (RGR), Doubling time (Dt).

1. Introduction

India and South Korea have different traditional, architecture and culture. Therefore, a comparative analysis of research productivity on Architecture between the India and South Korea. Scientometrics is an analysis of quantitative features and characters of scholarly communication on any field. Its Emphasis is placed on the investigation in which the development and mechanism of science are studied by statistical mathematical techniques. Therefore, an attempt has been made to analyze and determine the Relative Growth Rate (RGR); Doubling time of research publications; authorship pattern; collaborative measures and ranking of journals based on a few publications appeared and make suggestions for special libraries dealing with architecture collections for framing the library policy and program.

2. Literature Review

Pattanashetti & Harinarayana (2017) has inspect the research output of Mechanical engineering of Indian and South Korean indexed in Science Citation Index – Web of Science for the period 2011 2015 by several parameters like growth of literature, communication channels and geographical distribution, collaborative between different countries publication and Top productivity institutions, most productive authors, and cited research paper. They founded 11,041 publication and count 34,437 citation. They suggest that to improve the quality of Indian and South Korea research publication. Also they suggest to build a competence and knowledge base research output to help bridge fill gap between Science and Technology of leading countries. Gupta et al. (2013) are analyses the deferent qualitative and quantitative measures of Science and Technology (S&T) publications of 15 years i.e., 1996 to 2011 retrieved from SCOPUS database. They suggest that need to increase the quality of Indian research publication compared with other developed countries. Also, India have developed scientific capacity in research publication. Brij Mohan Gupta (2010) is compared overall S&T publications output of India, China and South Korea from twenty broad subjects as extracted by the SCOPUS database in terms of growth of publication, share of Publication collaboration, H-Index and Most cited papers. He explained that china has far better South Korea and India in the global publication and h-Index but lack behind in the international collaborative and high cited papers.

3. Architecture in India and South Korea

Indian architecture, means “Vastu-Shastra”, literally "Science of construction" have glorious from Mamuni Mayan (Mahabharat period) to Indo-Saracenic Revival architecture, developed by the British in the late 19th century, depicted on Indo-Islamic architecture (*India - Wikipedia*, 2020). South Korea have tumultuous history, construction and destruction has been repeated boundlessly, resulting in an interesting combination of architectural styles and designs. The Korean traditional architecture is considered by its harmony with nature. After Korean War the reconstruction, incorporating modern architectural trends and styles in architecture. Development of economic growth in the 1970s and 1980s, active redevelopment saw new horizons in architectural design. Contemporary architectural efforts have been constantly trying to balance the traditional philosophy of "harmony with nature" and the fast-paced urbanization that the country has been going through in recent years (*South Korea - Wikipedia*, 2020).

4. Objectives

To find out the growth rate of research publications on architecture from India and South Korea

To compute the Relative Growth Rate and Doubling time of publications.

To find out Institutional productivity and channels of Publications

To Know the most prolific authors in architecture research literature

5. Method of Study

The SCOPUS database is chosen for the study. A total 62196 documents have been found, out of that 38807 from India and 23761 are originated from South Korea. Micro office 365 has been used for the data analysis.

6. Knowledge productivity on Architecture

Literature on architecture first published in year 1956, then gradually increases by year by year, recently every year the research productivity has attained more than 6000 publication. So, a total of 62196 publications found on Architecture in SCOPUS database.

6.1. Year-wise distribution of publications

Table-1 Year-wise Publication

Year	Publications	Year	Publications	Year	Publications
2021	411	2002	553	1983	9
2020	6308	2001	466	1982	6
2019	6840	2000	416	1981	8
2018	5912	1999	393	1980	7
2017	4847	1998	366	1979	5
2016	4774	1997	419	1978	7
2015	4353	1996	269	1977	4
2014	3656	1995	180	1976	7
2013	3197	1994	148	1975	1
2012	3107	1993	124	1974	3
2011	2752	1992	58	1973	6
2010	2266	1991	62	1972	1
2009	1951	1990	53	1971	4
2008	1801	1989	38	1970	2
2007	1651	1988	34	1969	3
2006	1572	1987	23	1967	1
2005	1288	1986	21	1964	1
2004	1015	1985	19	1958	1
2003	764	1984	12	1956	1

The table 2 reveals that India's publications in recent block period i.e., 20,993 (2016-2021), is twice than previous block period is 10,905 (2011-2015) whereas it is not in case of South Korea. Therefore, it is inferred that comparatively, India's publications is higher than South Korea.

Table-2 Research Publication in Five-year Block period

Year	India	South Korea	Collaborated	Total
2016-2021	20993	8327	228	29092
2011-2015	10905	6255	95	17065
2006-2010	4238	5037	34	9241
2001-2005	1462	2633	9	4086
1996-2000	664	1205	6	1863
1991-1995	299	273	0	572
1986-1990	140	29	0	169
1981-1985	53	1	0	54
1976-1980	29	1	0	30
1971-1975	15	0	0	15
1966-1970	6	0	0	6
1961-1965	1	0	0	1
1956-1960	2	0	0	2
	38807	23761	372	62196

6.2. Relative Growth Rate (RGR) and Doubling time (Dt) of productivity

Relative Growth Rate (RGR) and Doubling time (Dt) is related to growth study of the literature productivity. RGR is relative growth rate of the publication means the increase the number of productivity in the specific period and Dt is directly related to relative growth rate and is defined as the time required for the publication to become double of the existing amount (Science, 1994).

Table-3 RGR and Dt

Year	No. of Publication	Cumulative No	Log p1	Log p2	RGR	Mean RGR	Dt	Mean Dt
1956-1960	2	2	-	0.69	-	-	-	-
1961-1965	1	3	0.69	1.10	0.41		0.59	
1966-1970	6	9	1.10	2.20	1.10		1.59	
1971-1975	15	24	2.20	3.18	0.98		1.42	
1976-1980	30	54	3.18	3.99	0.81		1.17	
1981-1985	54	108	3.99	4.68	0.69		1.00	
1986-1990	169	277	4.68	5.62	0.94		1.36	
1991-1995	572	849	5.62	6.74	1.12	0.86	1.62	1.24
1996-2000	1863	2712	6.74	7.91	1.16		1.68	
2001-2005	4086	6798	7.91	8.82	0.92		1.33	
2006-2010	9241	16039	8.82	9.68	0.86		1.24	
2011-2015	17065	33104	9.68	10.41	0.72		1.05	
2016-2021	29092	62196	10.41	11.04	0.63		0.91	

Growth of architecture literature is depicted in table 3. The highest growth of literature found during the year 1996-2000 and lowest growth of literature in the beginning year 1961-1965. The mean relative growth rate is 0.86 and mean doubling time is 1.24. After the year, 2001 relative growth rate and doubling time has gradually decreases.

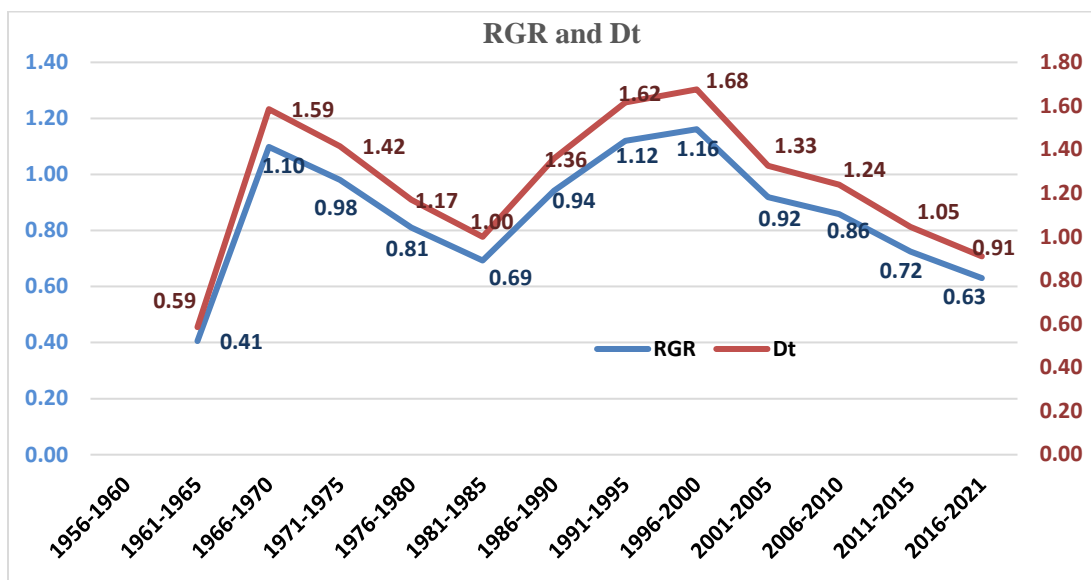


Fig. 1 RGR and Dt

6.3. Institutional productivity

Table-4 Top 20 Affiliated Institution

Ranking	Affiliation	Country	Publications
1	Korea Advanced Institute of Science & Technology	S. Korea	2607
2	Seoul National University	S. Korea	2326
3	Electronics and Telecommunications Research Institute	S. Korea	1929
4	Yonsei University	S. Korea	1229
5	Indian Institute of Science, Bengaluru	India	1223
6	Samsung Electronics Co. Ltd.	S. Korea	1194
7	Indian Institute of Technology Kharagpur	India	1187
8	Korea University	S. Korea	1162
9	Sungkyunkwan University	S. Korea	1158
10	Anna University	India	930
11	Hanyang University	S. Korea	856
12	Pohang University of Science and Technology	S. Korea	847
13	Indian Institute of Technology Delhi	India	829
14	Vellore Institute of Technology, Vellore	India	805
15	Indian Institute of Technology, Bombay	India	788
16	Kyungpook National University	S. Korea	766
17	Indian Institute of Technology Madras	India	717
18	Kyung Hee University	S. Korea	664
19	Jadavpur University	India	627
20	Indian Institute of Technology Kanpur	India	576

The table 4 depicts the institution-wise publications. Highest numbers of publications were originated from Korea Advanced Institute of Science & Technology (South Korea) i.e., 2607 followed by Seoul National University (2326); and Electronics and Telecommunications Research Institute stands 3rd position with 1929 publication.

6.4. Prolific of Authors in terms of publications

Table 5 Top twenty prolific authors list

Sl. No	Name	Country	Publication
1	Yoo, H.J.	S. Korea	126
2	Choi, K.	S. Korea	109
3	Nandy, S.K.	India	109
4	Oh, S.K.	S. Korea	104
5	Dhar, A.S.	India	85
6	Rahaman, H.	India	85
7	Park, I.C.	S. Korea	83
8	Sunwoo, M.H.	S. Korea	83
9	Kang, S.	S. Korea	82
10	Kim, L.S.	S. Korea	82
11	Gupta, M.	India	79
12	Hong, C.S.	S. Korea	78
13	Kim, H.K.	S. Korea	78
14	Kim, S.D.	S. Korea	78
15	Chakrabarti, I.	India	77
16	Lee, H.	S. Korea	76
17	Pedrycz, W.	S. Korea	74
18	Saxena, M.	India	74
19	Park, B.G.	S. Korea	71
20	Paul, A.	India	70

In the above table shows that highly productive author(s) on Architecture. Yoo, H.J. has produced 126 publications followed by Choi, K. with 109 publications. Both are south Korean second position shared Nandy, S.K. with 109 he from Indian. Therefore, it is inferred that South Korean authors are more productive than Indian authors.

6.5. Forms of the document

Table 6 Types of the Document

Sl. No	Type	India	Korea	Total
1	Article	18178	12080	29989
2	Conference Paper	18064	10831	28830
3	Review	1038	498	1515
4	Book Chapter	1286	202	1479
5	Book	120	27	142
6	Short Survey	26	32	57
7	Editorial	18	33	50
8	Note	20	26	46
9	Letter	20	14	34
10	Erratum	9	11	19
11	Data Paper	9	3	12
12	Retracted	5	0	5
13	Business Article	0	1	1
14	Undefined	14	3	17

Table 6 show that form of the document which published on Architecture. Highest published research in the form of journal articles i.e., 29989, followed by conference papers with 28830 publications and reviews 1515 publications.

6.6. Channels of publications

Table 7 Channels of communication

Sl. No	Source	Publications
1.	Lecture Notes in Computer Science Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics	1808
2.	Advances in Intelligent Systems and Computing	1005
3.	Communications in Computer and Information Science	723
4.	International Journal of Applied Engineering Research	621
5.	Lecture Notes in Electrical Engineering	547
6.	ACM International Conference Proceeding Series	482
7.	IEEE Access	321
8.	Proceedings of SPIE The International Society for Optical Engineering	300
9.	IEEE Region 10 Annual International Conference Proceedings TENCON	288

10.	International Journal of Innovative Technology and Exploring Engineering	288
11.	Proceedings IEEE International Symposium on Circuits and Systems	269
12.	Proceedings of The IEEE International Conference on VLSI Design	253
13.	Procedia Computer Science	250
14.	Journal of Advanced Research in Dynamical and Control Systems	227
15.	IEEE Transactions on Consumer Electronics	221
16.	Wireless Personal Communications	213
17.	ACS Applied Materials and Interfaces	206
18.	International Journal of Recent Technology and Engineering	205
19.	RSC Advances	205
20.	Scientific Reports	203

The above table reveals that “Lecture Notes in Computer Science Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics” is most preferred channel with 1808 publications followed by “Advances in Intelligent Systems and Computing” that is 1005 publications; Communications in Computer and Information Science that is 723 publications.

7. Conclusion

The study results may help the library authority of Architecture libraries in India and South Korea dealing with collections in general and Architecture in particular, to frame the library policy and chalk out the programmes as well as allocate the library budget. It may also help to subscribe to the core journals also to weed out obsolete collections to make the collection up-to-date and lively.

References

Gupta, B M, Bala, A., & Kshitig, A. (2013). S&T Publications Output of India: A Scientometric Analyses of Publications Output, 1996-2011. *Library Philosophy and Practice*, 921.

Gupta, Brij Mohan. (2010). A comparative study of India, China and South Korea S&T publications output during 1999-2008. *Annals of Library and Information Studies*, 57, 207–221.

https://www.researchgate.net/publication/228509638_A_comparative_study_of_India_China_and_South_Korea_ST_publications_output_during_1999-2008

India - Wikipedia. (2020). <https://en.wikipedia.org/wiki/India>

Pattanashetti, D. M., & Harinarayana, N. S. (2017). Assessment of Mechanical Engineering Research Output Using Scientometric Indicators: a Comparative Study of India and South Korea. *SRELS Journal of Information Management*, 54(2), 78.

<https://doi.org/10.17821/srels/2017/v54i2/111917>

Science, I. (1994). Correlation between growth of publications and citations: a study based on growth curves. *Annals of Library Science and Documentation*, 41(1), 8–12.

South Korea - Wikipedia. (2020). https://en.wikipedia.org/wiki/South_Korea