Mapping of Manomaniam Sundarnar University Publications: A Scientometric Analysis

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Abstract

This study analyzes Manonmaniam Sundaranar University (MS University) research publications measured from Histcite software and other tools. The results show that the growth of literature in Manomaniam Sundarnar University, Tamil Nadu deposition and make the quantitative assessment of the research in terms of year-wise research output, geographical distribution, nature of collaboration, characteristics of highly productive institutions and the channel of communication used by the scientists.

1. INTRODUCTION

Scientometrics is a discipline which analyses scientific publications and citations appended to the papers to gain an understanding of the structure of science, growth of science at global level, performance of a country in a particular domain, performance of institutions, departments/divisions, and scientific eminence of an individual scientist. Research publications are clearly one of the quantitative measures for the basic research activity in a country. It must be added, however, that what excites the common man, as well as the scientific community, are the peaks of scientific and technological achievement, not just the statistics on publications.

2. LITERATURE REVIEW

Kumar, Prakasan, Kalyane and Vijai Kumar focused on publishing trend; impact factor; authorship pattern; types of articles; institutional collaboration of authors; affiliated institutions of authors; countries of contributing authors; keyword analysis; and referencing pattern [1]. N. M. Builova and A.I. Osipov submitted the brief information and analytical survey of the papers to the Third International Nanotechnology Forum that was held in Moscow on November 1-3, 2010 [2]. Dilruba Mahbuba, Ronald Rousseau and Divya Srivastava gave a special attention n to research impact through time series of the institutional h- and R-indices, as well as to the trend in yearly citations received. Types of publications, international collaboration with other countries, top scientists and most cited articles co-authored by scientists from these institutions are highlighted. It is observed that female scientists play a minor role in these two institutes [3]. B. M. Gupta and S.M. Dhawan discussed the present status of India's collaboration with China in S&T, analyses the collaborative research between India and China, as reflected in the co-authored papers, in particular its nature, strong and weak areas and its impact in different subject fields and indicates the potential areas in S&T for future collaboration [4]. Wei Xu and Yi-Zhang Chen made clear that an economically and scientifically developing country like China done research in the field of Neuroscience. A MEDLINE based bibliometric analysis was done in the Chinese output in neuroscience was done for the period of 1984 to 2001 [5].

3. AREA OF STUDY

Manonmaniam Sundaranar University was established on 7th September,1990 to cater to the long felt needs of the people of the three southern most district of Tamil Nadu namely Tirunelveli, Tuticorin and Kanyakumari. There are 24 departments in the University and provided 280 connections in the University Campus spread 17 Buildings for accessing e-resources. The number of students enrollments is

steadily increasing. Moreover Sri Paramakalyani Centre for Environmental Sciences functioning at Alwarkurichi is an illustrious example of University-Industry collaboration while the Centre for Marine Science and Technology at Coastal area of Rajakamangalam in Kanyakumari District is breaking new ground in Coastal Area Studies. The mission of the University is by providing quality education, especially for the rural and the un-reached, through innovation in teaching, research and extension activities and by providing human values for social harmony.

4. METHODOLOGY

Data was collected from the Science Citation Index (SCI) which is available via the Web of Science (WoS). SCI database is one of the very comprehensive databases covering all aspects of science. The study period (1992-2011) is selected as the database is available in machine from since 1982. The search string

"MS University" in the "Basic Search" field of SCI was used for the year s 1992-2011 to download the records on the subjects 'MS University'. A total of 363 records were downloaded and analyzed by using the Histcite software application as per the objectives of the study.

5. RESULTS AND DISCUSSION

The *t*-test for dependent samples helps us to take advantage of one specific type of design in which an important source of within-group variation (or so-called, error) can be easily identified and excluded from the analysis. Specifically, if two groups of observations (that are to be compared) are based on the same sample of subjects who were tested twice (e.g., before and after a treatment), then a considerable part of the within-group variation in both groups of scores can be attributed to the initial individual differences between subjects.

The above Table 1 reveals that the top twenty research productive. The most productive author is Nair

Table 1 Author-wise Document Distribution (First 20 Documents)

S. No.	Author	Records	Percent	TLCS	TLCS/t	TGCS	TGCS/t	TLCR	TLCSb	TLCSe
1	Nair MS	47	12.9	97	9.12	191	20.64	93	34	-
2	Padiyan DP	27	7.4	13	2.73	106	13.81	13	2	-
3	Rajasekar S	23	6.3	24	1.48	195	14.00	24	17	-
4	Murugesan AG	22	6.1	18	3.48	67	13.76	18	4	-
5	Subramanian E	21	5.8	16	2.42	135	20.31	16	8	-
6	Viswanathan MB	20	5.5	10	0.87	79	7.77	10	6	-
7	Arumugam S	17	4.7	4	0.30	52	6.16	4	-	-
8	Neelakantan MA	17	4.7	35	2.84	84	7.56	57	17	4
9	Kumaresan S	16	4.4	8	1.27	44	7.13	9	5	-
10	Ramesh N	16	4.4	10	0.87	78	7.44	10	6	-
11	Veluraja K	15	4.1	23	2.28	102	10.19	23	12	-
12	Arasu PT	14	3.9	60	3.47	93	5.44	31	25	-
13	Chellamani A	13	3.6	45	4.40	181	14.33	45	7	5
14	Gopalakrishnan S	12	3.3	6	1.25	76	7.46	6	0	-
15	Immanuel G	10	2.8	1	0.20	16	4.58	4	-	-
16	Lekha PC	10	2.8	6	1.77	15	3.70	8	-	-
17	Murugesan R	10	2.8	7	0.76	79	8.68	3	5	-
18	Pillai MS	10	2.8	47	2.64	71	4.01	23	17	-
19	Subramanian S	10	2.8	5	1.67	13	3.75	8	-	-
20	Kumar G	9	2.5	16	2.90	48	9.85	16	4	1

TLCS-Total Local Citation Score, TGCS-Total Global Citation Score, t - T Test, TLCR-Total Local Citation Reference, TLCSb - Total Local Citation Score Beginning, TLCSe - Total Local Citation Score Ending

Table 2 Journal-wise Document Distribution (First 20 Documents)

S.No.	Journal	Recs	Percent	TLCS	TLCS/t	TGCS	TGCS/t	TLCR
1	Indian Journal of Chemistry Section A-Inorganic Bio-Inorganic Physical Theoretical & Analytical Chemistry	22	6.1	45	3.37	85	6.40	49
2	Journal of The Indian Chemical Society	19	5.2	16	1.56	39	3.76	31
3	Physical Review C	11	3.0	4	0.24	82	9.37	5
4	Pramana-Journal of Physics	9	2.5	9	0.64	24	1.51	10
5	Ars Combinatoria	7	1.9	0	0.00	5	0.49	2
6	Journal of Applied Statistics	7	1.9	0	0.00	3	0.18	0
7	Journal of Coordination Chemistry	7	1.9	7	2.53	24	7.57	8
8	Journal of Environmental Biology	7	1.9	1	0.14	18	3.25	5
9	Materials Chemistry and Physics	7	1.9	6	0.96	53	7.42	3
10	Acta Crystallographica Section E-Structure Reports Online	6	1.7	0	0.00	30	4.53	4
11	Crystal Research and Technology	6	1.7	7	0.87	58	5.41	0
12	Fitoterapia	6	1.7	4	0.36	27	2.98	1
13	Aquaculture International	5	1.4	7	1.26	22	3.83	5
14	Journal of Biomolecular Structure & Dynamics	5	1.4	12	1.35	33	4.19	15
15	Pharmaceutical Biology	5	1.4	3	0.49	8	1.05	4
16	Physica B-Condensed Matter	5	1.4	0	0.00	1	0.14	5
17	Physical Review E	5	1.4	8	0.47	62	3.88	4
18	Bulletin of Materials Science	4	1.1	4	0.44	36	4.28	6
19	Chaos Solitons & Fractals	4	1.1	2	0.18	58	4.76	5
20	Current Applied Physics	4	1.1	3	1.17	4	1.50	1

MS with each 47 papers with 288 citations dealing with MS University and each 12.9% of all papers published in this research Institution. The authors of the seminal publication on MS University has given in Table 1. Padiyan DP (7.4%) and Rajasekar SN(6.3%), appear on rank 2 & 3 (27 papers and 23 papers respectively).

The most productive Journal is Indian Journal of Chemistry Section-A. Inorganic, bio-inorganic physical theoretical & analytical chemistry with 22 papers dealing with MS University and 6.1% of all papers published in this research Institution. The journal of the seminal publication on MS University has given in Table 2. Journal of the Indian Chemical Society and Physical Review appear on rank 2 (5.2%) and 3(3.0%) respectively.

The most cited reference is Gans P, 1976, Inorg Chim Acta, v18, p237 with each 7705 papers dealing with MS University and each 5.2% of all papers published in this research Institution. The cited reference of the seminal publication on MS University is given Table 3, appear on rank 2 & 3 Nair MS, 1993, J Chem Soc Da, p. 917 and Nair MS, 1993, Talanta, v40, p.1411 respectively. It can be clearly visualized from the below table.

Analysis of the keywords appeared either on the title or assigned by the indexer or the author himself will help in knowing in which direction the knowledge grows. The high frequency keywords will enable us to understand the various aspects of MS University under study. The high frequency keywords were: Complexes 12.4%, India 8.3%, Effect 6.9%, Properties 6.6% and Nickel 6.1%. The remaining keywords all are having below 6% among the top twenty key terms occurrence.

Table 3 Cited Reference-wise Documents Distribution (first-20 Countries)

S.No.	Author / Year / Journal		Recs	%
1	Gans p, 1976, Inorg Chim Acta, v18, p237	WoS	19	5.2
2	Nair MS, 1993, J Chem Soc Da, p917	WoS	18	5.0
3	Nair MS, 1993, Talanta, v40, p1411	WoS	10	2.8
4	Nair MS, 1995, Transit Metal Chem, v20, p132	WoS	10	2.8
5	Rajasekar S, 1993, Physica D, v67, p282	WoS	10	2.8
6	Srinivasan C, 1990, J Chem Soc Perk Nov, p1839	WoS	10	2.8
7	Srinivasan K, 1986, J Am Chem Soc, v108, p2309	WoS	10	2.8
8	Chellamani A, 1995, Tetrahedron, v51, p12677	WoS	9	2.5
9	Martell AE, 1974, Critical Stability c, v1	WoS	9	2.5
10	Perez C, 1990, Acta Biol Med Expt, v15, p113	WoS	9	2.5
11	Sigel H, 1980, Coord Chem, v20, p27	WoS	9	2.5
12	Bauer AW, 1966, Am J Clin Pathol, v45, p493	WoS	8	2.2
13	Geary WJ, 1971, Coordin Chem Rev, v7, p81	WoS	8	2.2
14	Harary F, 1969, Graph Theory	WoS	8	2.2
15	Lever ABP, 1971, Inorganic Elect Spec	WoS	8	2.2
16	Lowry OH, 1951, J Biol Chem, v193, p265	WoS	8	2.2
17	Nair MS, 1981, J Chem Soc Da, p992	WoS	8	2.2
18	Nair MS, 1997, Indian J Chem A, v36, p879	WoS	8	2.2
19	Sayce IG, 1968, Talanta, v15, p1397	WoS	8	2.2
20	Sigel H, 1971, Metal Ions Biol Syst, v1	WoS	8	2.2

During 1992- Feb2011 a total of 363 publications were published in MS University by India. The average Number of Publications produced per year was 18.15%. The highest number of publications 51 was produced in 2010. Table 5 was given year wise growth and collaboration rate in MS University. It can be clearly visualized from the Table 5 that growth of the literature was very low during 1992. It Indicate that research in MS University received a major impetus this period.

MS University Scientists communicated their research results through a variety of communication channels. Table 6 provides the distribution of publications in various channels of communication. It was observed that 93.9 % of the literature was published in Article followed by 2.2 percent in Note, 1.7 % in Proceedings Paper, 0.6 % in Correction, 0.6 % in Editorial Material and each 0.3 % in Biographical Item, Book Review, Letter, and Review.

There were 371 institutions and subdivisions involved in research activity in the Institution of MS University. Table 7 provides publication productivity of top 20 institutions. Manonmaniam Sundaranar University, Dept. of Chemistry topped the list with 71 publications followed by Manonmaniam Sundaranar University, Dept. of Physics with 62 publications, Manonmaniam Sundaranar University, Sri Paramakalyani Center for Environment Science with 25 publication, Manonmaniam Sundaranar University, Dept Mathematics with 20 publications.

There were as many as 14 countries collaborated along with India carrying out research in the Institution of MS University with 488 authors. Table 8 provides a list of countries whose research output is more than 50 publications. South Korea is collaborated with Manomanian Sundarnar University 14 publications (3.9%), USA is 6 publications (1.7%) and Japan and UK is each 4 publications. And the remaining countries such that, Germany, Oman, Peoples R China, etc having collaborated with Manomanian Sundarnar University is below one percent.

Table 4 Word-wise Distribution of Documents (First-20 Documents)

S.No.	Word	Records	Percent	TLCS	TGCS
1	Complexes	45	12.4	117	319
2	India	30	8.3	3	43
3	Effect	25	6.9	29	116
4	Properties	24	6.6	8	62
5	Nickel	22	6.1	60	131
6	Acid	21	5.8	58	108
7	Polyaniline	17	4.7	18	109
8	Synthesis	17	4.7	17	52
9	Characterization	16	4.4	16	45
10	Ligand	15	4.1	18	37
11	Activity	14	3.9	7	82
12	Containing	14	3.9	26	49
13	Ligands	14	3.9	54	91
14	Schiff	14	3.9	15	32
15	Thin	14	3.9	10	54
16	Analysis	13	3.6	9	65
17	Base	13	3.6	15	35
18	Graphs	13	3.6	1	20
19	Influence	13	3.6	11	60
20	Involving	13	3.6	44	78

Table 5 Year-wise Distribution of Documents

S.No.	Publication Year	Records	Percent	TLCS	TGCS
1	1992	2	0.6	2	4
2	1993	5	1.4	35	63
3	1994	4	1.1	5	17
4	1995	18	5.0	38	190
5	1996	7	1.9	5	15
6	1997	11	3.0	18	133
7	1998	12	3.3	6	31
8	1999	21	5.8	34	127
9	2000	18	5.0	16	111
10	2001	20	5.5	15	114
11	2002	14	3.9	10	60
12	2003	19	5.2	25	122
13	2004	22	6.1	19	106
14	2005	17	4.7	5	135
15	2006	12	3.3	17	61
16	2007	30	8.3	17	79
17	2008	29	8.0	10	63
18	2009	46	12.7	13	61
19	2010	51	14.0	5	10
20	2011	5	1.4	-	-

Table 6 Source-wise Distribution Documents

S.No.	Document Type	Records	Percent	TLCS	TGCS
1	Article	341	93.9	278	1374
2	Note	8	2.2	13	88
3	Proceedings Paper	6	1.7	1	7
4	Correction	2	0.6	0	0
5	Editorial Material	2	0.6	2	8
6	Biographical-Item	1	0.3	0	0
7	Book Review	1	0.3	0	0
8	Letter	1	0.3	0	6
9	Review	1	0.3	1	19

Table 7 Institution and Subdivision-wise (First-20 Documents)

S. No.	Institution with Subdivision	Recs	Percent	TLCS	TGCS
1	Manonmaniam Sundaranar University, Dept. of Chemistry	71	19.6	103	424
2	Manonmaniam Sundaranar University, Dept. of Physics	62	17.1	56	425
3	Manonmaniam Sundaranar University, Sri Paramakalyani Center for Environment Science	25	6.9	23	148
4	Manonmaniam Sundaranar University, Dept Mathematics	20	5.5	3	56
5	Madurai Kamarajar University, School Chemistry	10	2.8	53	209
6	Subramanian, S. MDT Hindu College	10	2.8	5	13
7	Bharathiar University, Dept. of Environment Science	9	2.5	5	39
8	Manonmaniam Sundaranar University, Center Marine Science & Technology	7	1.9	10	36
9	Manonmaniam Sundaranar University, Dept. of Statistics	7	1.9	-	7
10	National Engineering College, Dept. of Chemistry	6	1.7	10	32
11	ST Hindu College, Dept. of Chemistry	6	1.7	41	62
12	Kumar, G.; Murugesan	6	1.7	2	12
13	Bharathidasan University, Dept. of Physics	5	1.4	6	55
14	Indian Institute Science, Dept. of Meteorology	5	1.4	4	12
15	Manonmaniam Sundaranar University, Dept. of Computer Science & Engineering	5	1.4	-	7
16	Lekha, P. Chithra; Padiyan	5	1.4	2	3
17	Nair, M. Sivasankaran; Raj	5	1.4	1	1
18	Subramanian, Esakkiappan Manonmaniam Sundaranar University	5	1.4	2	23
19	AKGS Arts College, Dept. of Physics	4	1.1	1	14
20	Central Electrochemical Research Institute, Karaikkudi	4	1.1	-	9

Table 8 Countries-wise research output

S.No.	Country	Recs	Percent	TLCS	TGCS
1	South Korea	14	3.9	5	40
2	USA	6	1.7	3	16
3	Japan	4	1.1	4	27
4	UK	4	1.1	0	17
5	Germany	3	0.8	0	32
6	Oman	3	0.8	0	3
7	Peoples R China	3	0.8	1	3
8	France	2	0.6	0	18
9	Mexico	2	0.6	0	1
10	Saudi Arabia	2	0.6	0	0
11	Australia	1	0.3	0	0
12	Eritrea	1	0.3	0	0
13	Italy	1	0.3	0	1
14	Netherlands	1	0.3	0	0

6. CONCLUSION

This study point out from the author wise analysis the author "Nair MS" has the highest producer of the Department of Chemistry, MS University. By the journal-wise analysis the most productive Journal is "Indian journal of Chemistry Section A, Inorganic Bio-inorganic Physical Theoretical & Analytical Chemistry" published more articles in the Institution of MS University. By seeing the word occurrence (used by Zipf's Law) analysis the high frequency keywords are "Complexes", "Effort", "India" are frequent occurrence in the sample data. The average number of publications produced per year was 18.15%. It was observed that the 93.9 % of the literature was published in article. By seeing institution- wise analysis Manonmaniam Sundaranar University, Dept. of Chemistry is highest participation of publication. It could be identified the collaborated countries along with India, South Korea is having the highest output. The most cited reference is Gans P, 1976, Inorg Chim Acta, v18, p237 with each 7705 papers dealing with MS University and each 5.2% of all papers published in this research Institution.

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