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Scientific Publications of Manonmaniam Sundaranar University, Tirunelveli, Tamilnadu: Scientometric Analysis

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Abstract

The study is based on the scientific publications generated by the Manonmaniam Sundaranar University, Tirunelveli, Tamilnadu. The data was collected from the Web of Science. The analysis highlights yearly output of research product. This study focuses on publishing trend, impact factor, authorship pattern, types of articles, institutional collaboration of authors, affiliated institutions of authors, countries of contributing authors and individual author's research productivity and their TLCS (Total Local Citation Score), TGCS (Total Global Citation Score) TLCR (Total Local Citation References) and TLCSb (Total Local Citation Score in the beginning).

Keywords

Research Productivity, Manonmaniam Sundaranar University, Web of Science, scientific publication.

Introduction

Scientometrics is the study of the quantitative aspects of science as a discipline or economic activity. It is part of the sociology of science and has application to science policy-making. It involves quantitative studies of scientific activities, including, among others, publication, and so overlaps bibliometrics to some extent. The researchers in scientific disciplines form the bigger, but also the most diverse, interest-group in scientometrics. Due to their primary scientific orientation, their interests are strongly related to their specialty. The researcher tries to find the scientific productivity of Manonmaniam Sundaranar University in the Web of Science database. Though our University was started in 1990, our scientific results came out in 1992. 363 results were discovered from 1992 to 2011 August 31st.

Area 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 districts of Tamilnadu, namely Tirunelveli, Tuticorin and Kanyakumari. There are 24 departments in the University and we have provided 280 connections in the University. Campus spreads 17 Buildings for accessing e-resources. The number of student 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 the coastal area of Rajakamangalam in Kanyakumari District is breaking new ground in Coastal Area Studies. We are doing so many academic programs that are of benefit to the society in the direct manner. Our mission is providing quality education, especially for the rural and the

un-reached, through innovation in teaching, research and extension activities and providing human values for social harmony.

Need for the Study

Bala and Gupta¹ analyzed the share of international collaborative papers in India's research output and the characteristics of research output of major Indian institutions, authors, and highly-cited papers. The patterns of research communication by Indian scientists in most productive journals in this discipline have also been evaluated. Kumar, Prakasan, Kalyane, and Kumar² focused on publishing trends; impact factor; authorship pattern; types of articles; institutional collaboration of authors; affiliated institutions of authors; countries of contributing authors; keyword analysis; and referencing pattern. Builova and Osipov³ 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. Mahbuba, Rousseau, and Srivastava⁴ gave a special attention 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. Gupta and Dhawan⁵ discussed the present status of India's collaboration with China in S&T, analysed 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.

Limitation

The study is confined to a period of 1992 to August 2011 covered in the database **Web of Science** only.

Methods

The Web of Science database was searched under the Address heading – **Manonmaniam Sundaranar University** research in the field of Search Box.

Data Analysis

The data was investigated with the toolbox Histcite and Bibexcel. The Bibexcel was developed by Olle Persson, Inforsk, Umeå Univ (Sweden). This software is designed to assist a user in analyzing bibliographic data, or any data of a textual nature formatted in a similar manner.

Objectives of the Study

- Observe the Manonmaniam Sundaranar University research productivity in various practices.
- Find the authorship productivity.
- Find the research publication of each year from 1992 to August 2011.
- Find the document type.
- Find the TLCS (Total Local Citation Score), TGCS (Total Global Citation Score) TLCR (Total Local Citation References) and TLCSb (Total Local Citation Score in the beginning) for individual authors.
- Find the important journal publication of research output of Manonmaniam Sundaranar University.
- Find the distribution by country of research productivity.
- Find the research productivity by language.
- Find the Global Citation Analysis of Nodes and Links.
- Find the articles' Local Citation and Global Citation Score.

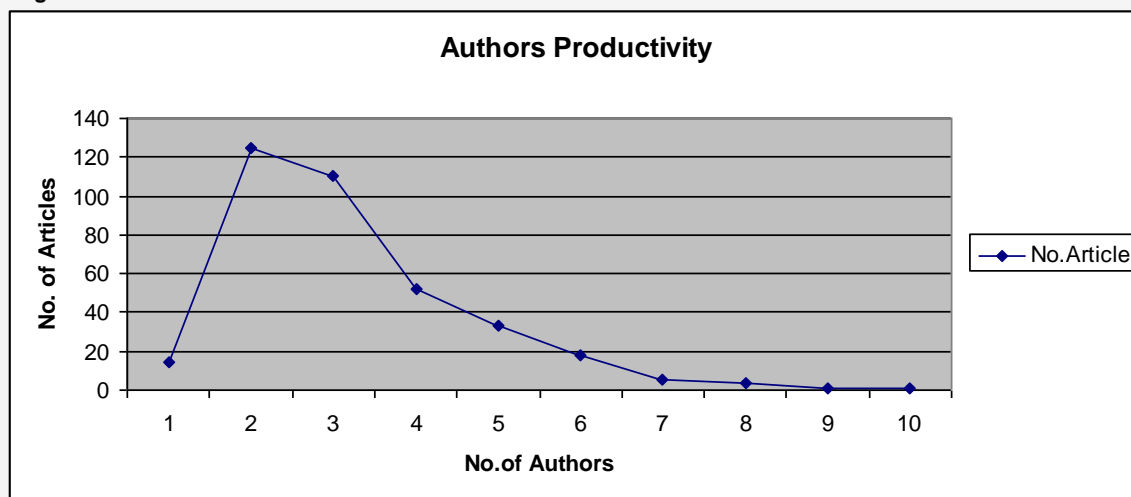
Authorship Productivity

Table 1 and Diagram 1 show authorship productivity. Only 14 research outputs were produced by single authors. 125 and 110 research outputs were produced by two and three authors respectively. It is clear that 3.86% of research was done by single authors, 34.44% by two, and 30.44% by three authors of scientific publications. Collaboration of research is evident in the field of scientific research.

Table 1
Authorship Productivity

S.No	No. Authors	No.Article	Percentage
1	Single	14	3.86
2	Joint	125	34.44
3	Three	110	30.3
4	Four	52	14.32
5	Five	33	9.1
6	Six	18	4.97
7	Seven	5	1.37
8	Eight	4	1.1
9	Nine	1	0.27
10	Twenty	1	0.27
	Total	363	100

Diagram 1



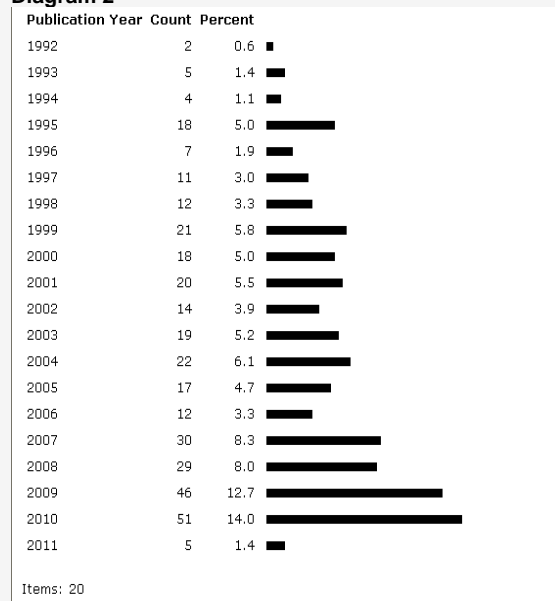
Research Publication

Manonmaniam Sundaranar University started to publish their research outlook in the year 1992. The publication rate is slowly increasing. But there are some ups and downs. The largest publication is in the year 2010. The year-wise distribution of literature is shown below in Table 2 and Diagram 2 shows the research productivity of each year.

Table 2 - Publication Year List (1992 - 2011)

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	38	190
5	1996	7	1.9	5	15
6	1997	11	3	18	133
7	1998	12	3.3	6	31
8	1999	21	5.7	34	127
9	2000	18	5	18	111
10	2001	20	5.5	16	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	10	63
18	2009	46	12.6	13	61
19	2010	51	14	5	10
20	2011	5	1.4	0	0
	Total	363	100		

Diagram 2



Document Type

Document type indicates the type of publication in which the researchers published their investigations. Most of them published in a journal.

Table 3 reveals the distribution of the research output according to document type. It is an accepted fact that most of the scholarly communication of scientific research is published in journals and sometimes presented in notes and proceedings papers. The TLCS (Total Local Citation Score) is 281 and TGCS (Total Global Citation Score) is 1374.

Table 3
Document Type of Manonmaniam Sundaranar University

S.No	Document Type	Recs	Percent	TLCS	TGCS
1	Article	341	93.8	281	1374
2	Note	8	2.2	13	88
3	Proceedings Paper	6	1.6	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
	Total	363	100		

Individual Authors Research Productivity:

Table 4 shows some of the author's individual publications. Added to that are the author's TLCS (Total Local Citation Score), TGCS (Total Global Citation Score) TLCR (Total Local Citation References) TLCSb (Total Local Citation Score in the beginning) and TLCe (Total Local Citation Score at the end). Dr. Nair's research records are 47. He got 97 in TLCS, 191 in TGCS, 93 in TLCR and 34 in TLCSb. Following in research output are Dr. Padiyan, Dr. Rajasekar and Dr. Murugan.

Table – 4
Research Publication of Individual Authors

S.No	Author	Recs	Percent	TLCS	TGCS	TLCR	TLCSb
1	Nair MS	47	12.9	97	191	93	34
2	Padiyan DP	27	7.4	13	106	13	2
3	Rajasekar S	23	6.3	24	195	24	17
4	Murugesan AG	22	6.1	18	67	18	4
5	Subramanian E	21	5.8	16	135	16	8
6	Viswanathan MB	20	5.5	10	79	10	6
7	Arumugam S	17	4.7	4	52	4	0
8	Neelakantan MA	17	4.7	35	84	57	17
9	Kumaresan S	16	4.4	8	44	9	5
10	Ramesh N	16	4.4	10	78	10	6

11	Veluraja K	15	4.1	23	102	23	12
12	Arasu PT	14	3.9	60	93	31	25
13	Chellamani A	13	3.6	45	181	45	7
14	Gopalakrishnan S	12	3.3	6	76	6	0
15	Immanuel G	10	2.8	1	16	4	0
16	Lekha PC	10	2.8	6	15	8	0
17	Murugesan R	10	2.8	7	79	3	5
18	Pillai MS	10	2.8	47	71	23	17
19	Subramanian S	10	2.8	5	13	8	0
20	Kumar G	9	2.5	16	48	16	4

Publication

Table 5 shows the important journal publication of research output of Manonmaniam Sundaranar University. The abbreviations of TLCS (Total Local Citation Score), TLCS/t (Total Global Citation Score per year) TGCS (Total Global Citation Score), TGCS/t (Total Global Citation Score per year) and TLCR (Total Local Citation References) are used. The research yield in the *Indian Journal of Chemistry Section A-Inorganic Bio-Inorganic Physical Theoretical & Analytical Chemistry* was 22. Following that is the *Journal of The Indian Chemical Society* with 19 and *Physical Review* with 11.

Table 5
Journal Publication

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	7	0.49	82	9.37	7
4	Pramana-Journal of Physics	9	2.5	9	0.64	24	1.51	11
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

Geographical Distribution

Table 6 shows the country wise distribution of research productivity. Most scientists published their results in India, followed by South Korea, the USA and Japan. Even though the scientists who published articles are in India, they got a TGCS (Total Global Citation Score) of 1502.

Table 6
Geographical Distribution

S.No	Country	Recs	TLCS	TGCS
1	India	316	298	1502
2	South Korea	14	5	40
3	USA	6	3	16
4	Japan	4	4	27
5	UK	4	0	17
6	Germany	3	0	32
7	Oman	3	0	3
8	Peoples R China	3	1	3
9	France	2	0	18
10	Mexico	2	0	1
11	Saudi Arabia	2	0	0
12	Australia	1	0	0
13	Eritrea	1	0	0
14	Italy	1	0	1
15	Netherlands	1	0	0

Distribution of Research Production by Language

The distribution of research by language is presented in Table 7. All the research results are published in English. Therefore, from the table, it is understandable that the English language is dominating in scholarly communication.

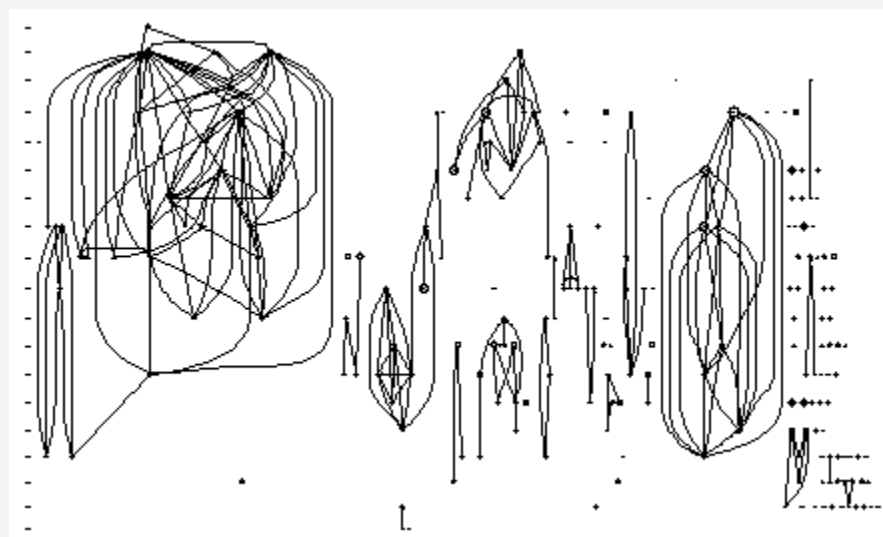
Table 7
Research Productivity by Language wise

S.No	Language	Recs	TLCS	TGCS
1	English	363	298	1502

Global Citation Analysis

Diagram 3 shows that the Global Citation of each and every research output of Manonmaniam Sundaranar University in the Web of Knowledge. Here we fix the Minimum Global Citation Score value as 3, the Maximum Citation Score as 61, with the Nodes as 152 and links as 151.

Diagram 3 Global Citation Analysis



Nodes: 152, Links: 151
GCS \geq 3; Min: 3, Max: 61 (GCS scaled)

Article Local Citation and Global Citation Score

Table 8 shows the Local Citation Score (LCS) and Global Citation Score (GLS) of some of the research articles. Dr. P. Rajathirumoni, 1992, Indian J Chem Sect A, V31, P760 got 2 as a Local Citation Score and 4 as a Global Citation Score. The fourth article of Dr. M S Nair, 1993, J Chem Soc Dalton Trans, P917 got 18 as a Local Citation Score and 27 as Global Citation Score, likewise. We are able to find out each and every research publication's LCS and GLS.

Table 8
Local and Global Citation of Each Article

		LCS	GCS
1	Rajathirumoni P, 1992, Indian J Chem Sect A, V31, P760	2	4
2	Nair Ms, 1993, J Chem Soc Dalton Trans, P917	18	27
3	Nair Ms, 1993, Indian J Chem Sect A, V32, P807	3	6
4	Nair Ms, 1993, Talanta, V40, P1411	10	15
5	Rajasekar S, 1993, Pramana-J Phys, V41, P295	4	15
6	Rajasekar S, 1994, J Theor Biol, V166, P275	4	12
7	Murugesan Ag, 1995, Bioresource Technol, V51, P97	0	6
8	Rajasekar S, 1995, Phys Rev E, V51, P775	5	43

Findings

1. Only 3.86% of the research done was by single authors. 96.14% of research was done by collaborative authors.
2. The prime number of publication in the year 2010 was 51.
3. In this study, about 93.9% have published journal articles. So journal article are termed as primary vehicles of research communication.
4. In individual author productivity, Dr.Nair's research records are 47 with 12.9%. His Total Local Citation Score is 97, Total Global Citation Score is 191, Total Local Citation Reference is 93 and Total Local Citation Score in the beginning is 34.
5. In journal publication, *Indian Journal of Chemistry Section A-Inorganic Bio-Inorganic Physical Theoretical & Analytical Chemistry* got 6.1% as the leading journal.

6. Our Manonmaniam Sundaranar University scientists present papers with the collaboration of other countries like South Korea, the United States of America, and Japan. Though our scientists produced 316 in India, they got Local Citation Scores of 298 and Global Citation Scores of 1502.
7. The English language is governing in learned communication. All of our publications are done in English only.
8. The Maximum Citation Score is 61.
9. We are capable of observing each and every study's LCS and GLS.

Conclusion

At the present time, scientometrics has become an important field of study to monitor the progress in scientific performance of a research group, a department, a university etc. Citations are ways to demonstrate how researchers build on existing investigations to further evolve research. The citation count is an indication of the power of specific articles. The significance of citations means that it is valuable to analyze the articles that are cited the most. This article focuses on publishing trends; impact factor; authorship pattern; types of articles; institutional collaboration of authors; affiliated institutions of authors; and countries of contributing authors. Added to that, this study examines the performance based research output of Manonmaniam Sundaranar University on its publication output.

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Appendix

GCS - Global Citation Score shows the total number of citations to a paper in Web of Science.

LCR - Local Cited References shows the number of citations in a paper's reference list to other papers within the collection.

LCS - Local Citation Score shows the count of citations to a paper within the collection.

CR - Number of Cited References shows the number of cited references in the paper's bibliography.

Recs - Number of Records shows the number of records where a given item is found.

T* - Total [score] Any Total score represents a sum of respective scores for all records from a given author, source, other category, or all records. e.g. TLCS = Total Local Citation Scores.

LCS/t = Local Citation Score per year from paper publication to the end of the collection.

GCS/t = Global Citation Score per year from paper publication to the end of the collection.

LCSb = Local citations at beginning of the time period covered. It is calculated as explained under "Collection Span" above.