Original Article

Research potential of Madurai Kamaraj University – A Scientometric view

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ABSTRACT
*Purpose - The purpose of this study is to conduct a scientometric analysis of the 'Research potential of Madurai Kamaraj University' by Thompson's Web of Science database for a period from 1999 to 2010. **Design/methodology/approach** – A total of 1431 articles were downloaded from Thompson' Web of Science database using the search term Maduai Kamaraj University subjected to Scientometric data analysis techniques. **Findings** – A number of research questions pertaining to publication frequency, country, and individual productivity and collaborative were proposed and answered. Based on the findings, many implications emerged that improve one's understanding of the identity of Bioinformatics as a distinct biomedical field. **Research limitations/implications** – The pool of articles are drawn from Thompson's Web of Science database only though there are other databases also*
Keywords: Madurai Kamaraj University; Scientometrics; Research; University Rankings; Universities and Colleges

INTRODUCTION

According to ARWU which considers every university that has any Nobel Laureates, Fields Medalists, Highly Cited Researchers, or papers published in Nature or Science. In addition, universities with significant amount of papers indexed by Science Citation Index-Expanded (SCIE) and Social Science Citation Index (SSCI) are also included. Research performance is one among the indicators for measuring the rank of a University. The current trend is "Publish or Perish". The quantum of papers published in peer reviewed journals have become a criteria for the evaluation of a scholar and thereby the institution he/she is affiliated to. The present study is a pioneering effort to study the research potential of Madurai Kamaraj University, Madurai.

LITERATURE REVIEW AND RESEARCH QUESTIONS

"Every organization has an interest in seeing its definition of reality accepted in the larger soci~a1context, for such acceptance is an integral part of the legitimation of the organization and the development of assured resources." -Pfeffer (1981).

The modern era of ranking academic institution and research started in 1983 in U.S. News and World Report followed by Business Week's MBA rankings in 1987/88. Salmi & Saroyan (2007) identify statistical annual reports published by the Commission of the US Bureau of Education from 1870-1890 that classified institutions. According to Pagell and Lusk's in his paper on business school rankings cites a series of early scholarly rankings Pagell & Lusk (2002). The earliest cited work, Raymond Hughes' "A Study of Graduate School of America", published on behalf of the America Council of Education. Hughes rated 19 graduate departments in the U.S., primarily Ivy League private universities and the major mid-western state universities. All but three of his initial 19 appear in one of three top 30 lists of worldwide universities. Magoun (1966) emphasizes the importance of the rankings to university administration and the importance of quality graduate programs to the country as a whole by comparing the three studies and analyzes the consistencies and changes during the 40 year interval. Kroc introduces citation analysis for schools of education and analyzes early challenges using Social Science Citation Index (SSCI), many of which persist today. Kroc, (1984) Robinson and Adler also measure citations for universities marketing faculty and doctoral graduates. Robinson & Adler (1981)

The ranking of higher education institutions (HEIs) has garnered a lot of attention in recent times. The prospective of students, especially postgraduates, use rankings to get an idea of a university's relative performance. This in turn encourages public bodies to pay attention to rankings when allocating funds to higher educational institutions. Due to increased competition between institutions and higher participation rates and greater student mobility, Marcotte et al, (2007), university rankings appeal to

students and governments alike because they provide information that would otherwise be difficult and costly to acquire. This widespread influence is putting pressure on schools to tailor themselves to better meet the criteria relevant to rankings in order to attract both students and funds. However, despite growing popularity, the ranking of universities remains a controversial issue and has been widely debated. Dehon et al (2009) offer a global view of these issues. Indeed, the very idea of summing up the various characteristics of an institution in a single measure of performance is questionable. And as rankings proceed from the aggregation of information, their results can vary due to the chosen methodology and criteria. Given the scope of their influence and their various drawbacks it is important to understand how these rankings are designed and what exactly they are measuring.

The present investigation contributes to overall trend of research of the Scholars of Madurai Kamaraj University by analyzing the literature available in Thomson's Web of Science database by using various Scientometric techniques. It proposes and answers six important research questions.

RQ1. What is the trend of research by the academicians in Madurai Kamaraj University?

RQ2. What are the more productivity journals preferred by scholars of Madurai Kamaraj University

RQ3. Whether social networking (National and international level) exist among the scholars of Madurai Kamaraj University.

RQ4. What are the funding agencies that have supported Madurai Kamaraj University in their research productivity?

DATA AND METHODS

Data were downloaded from Thomson's ISI Web of Science Database using the keyword Madurai in the city field and then narrowed down for institution Madurai Kamaraj University. Data were downloaded for a period from 1999 to 2010. The downloaded data is restricted to journal articles only by eliminating the other formats like editorial, letters, biographies etc. The data downloaded thus in the text format are converted into MS Excel, an MS office tool for analysis.

Limitations

This investigation concentrates on research productivity in terms of the number of publications covered in Thomson's ISI Web of Science Database only.

DISCUSSIONS
Table 1 Research productivity trend

Publication Years	Record Count	Growth Rate (%)
2007	146	10.203
2008	144	10.063
2009	130	9.085
2003	126	8.805
2010	124	8.665
2006	121	8.456
2005	120	8.386
2002	117	8.176
1999	112	7.827
2004	112	7.827
2001	107	7.477
2000	72	5.031
Total	1431	100.001
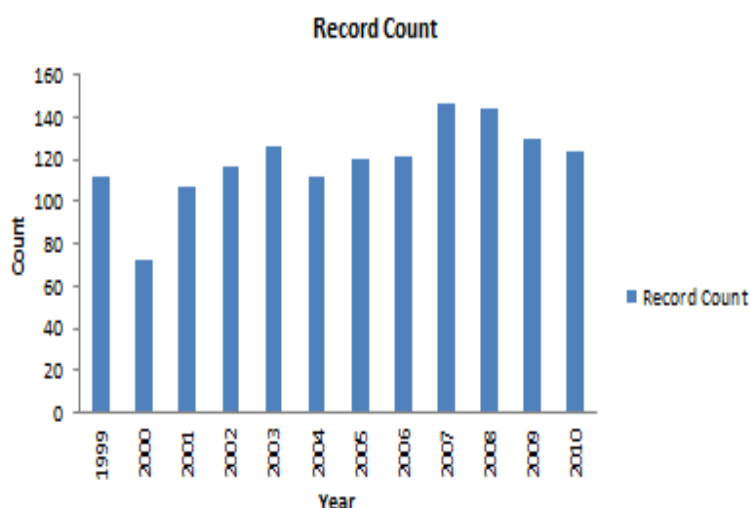
During the period of last twelve years from 1999 to 2010 1431articles were published. The research productivity in Madurai Kamaraj University is on the increase though not uniform. At the start of the new Millennium, the growth of publication trend has started with low and has got high during 2007 and 2008, while in 2010 the growth rate is negative. The average growth rate is 8.333 showing that every year the research productivity in Madurai Kamaraj University grows by 0.8333 per cent.

Table 2 Core preferred Journals

Contributions in Top Journals

Source Titles	Record Count	% of null
ACTA CRYSTALLOGRAPHICA SECTION E STRUCTURE REPORTS ONLINE	210	14.675
CURRENT SCIENCE	69	4.822
CRYSTAL RESEARCH AND TECHNOLOGY	33	2.306
SPECTROCHIMICA ACTA PART A MOLECULAR AND BIOMOLECULAR SPECTROSCOPY	31	2.166
INDIAN JOURNAL OF CHEMISTRY SECTION B ORGANIC CHEMISTRY INCLUDING MEDICINAL CHEMISTRY	29	2.027
TETRAHEDRON	29	2.027
JOURNAL OF RAMAN SPECTROSCOPY	25	1.747
PHOTOSYNTHETICA	19	1.328
INTERNATIONAL JOURNAL OF MODERN PHYSICS B	17	1.188
JOURNAL OF PHOTOCHEMISTRY AND PHOTOBIOLOGY A CHEMISTRY	17	1.188
ACTA CRYSTALLOGRAPHICA SECTION C CRYSTAL STRUCTURE COMMUNICATIONS	14	0.978
WORLD JOURNAL OF MICROBIOLOGY BIOTECHNOLOGY	14	0.978
JOURNAL OF BIOSCIENCES	12	0.839
MAGNETIC RESONANCE IN CHEMISTRY	12	0.839
SYNTHETIC COMMUNICATIONS	12	0.839
JOURNAL OF HETEROCYCLIC CHEMISTRY	11	0.769
JOURNAL OF MOLECULAR CATALYSIS A CHEMICAL	11	0.769
PHYSICA E LOW DIMENSIONAL SYSTEMS NANOSTRUCTURES	11	0.769
SOLAR PHYSICS	11	0.769
BULLETIN OF MATERIALS SCIENCE	10	0.699
INTERNATIONAL JOURNAL OF CHEMICAL KINETICS	10	0.699
JOURNAL OF APPLIED POLYMER SCIENCE	10	0.699
JOURNAL OF INCLUSION PHENOMENA AND MACROCYCLIC CHEMISTRY	10	0.699
TETRAHEDRON LETTERS	10	0.699
ACTA CHIROPTEROLOGICA	9	0.629

The total numbers of journals that have been used to contribute 1434 research articles by the researchers of Madurai Kamaraj Universities 434. The most preferred journal is 'Crystallography Journals Online' followed by Current Science. It is observed that, the majority of the contributions are from Science journals. This shows that scholars from various science discipline especially from Biology, Chemistry, and Physics etc., are interested in publishing more research articles.

Table 3 Social Networking with Scholars from Foreign countries

Countries/Territories	Record Count	% of null	Countries/Territories	Record Count	% of null	Countries/Territories	Record Count	% of null
USA	64	4.472	SOUTH AFRICA	5	0.349	VENEZUELA	2	0.14
JAPAN	29	2.027	COLOMBIA	4	0.28	ARMENIA	1	0.07
ENGLAND	27	1.887	CROATIA	4	0.28	BELGIUM	1	0.07
NORWAY	26	1.817	SPAIN	4	0.28	BRAZIL	1	0.07
ITALY	23	1.607	PAKISTAN	3	0.21	ESTONIA	1	0.07
GERMANY	22	1.537	REP OF GEORGIA	3	0.21	GAMBIA	1	0.07
TAIWAN	22	1.537	RUSSIA	3	0.21	KAZAKHSTAN	1	0.07
SRI LANKA	19	1.328	SWEDEN	3	0.21	KYRGYZSTAN	1	0.07
SOUTH KOREA	18	1.258	ARGENTINA	2	0.14	LEBANON	1	0.07
FRANCE	16	1.118	DENMARK	2	0.14	MEXICO	1	0.07
ISRAEL	13	0.908	ETHIOPIA	2	0.14	NEW ZEALAND	1	0.07
CANADA	8	0.559	GHANA	2	0.14	NORTH IRELAND	1	0.07
SINGAPORE	8	0.559	IRAN	2	0.14	POLAND	1	0.07
WALES	8	0.559	KUWAIT	2	0.14	TAJIKSTAN	1	0.07
CZECH REPUBLIC	7	0.489	SCOTLAND	2	0.14	TURKMENISTAN	1	0.07
SWITZERLAND	7	0.489	SLOVAKIA	2	0.14	UZBEKISTAN	1	0.07
MALAYSIA	5	0.349	THAILAND	2	0.14		400	
NETHERLANDS	5	0.349	TRINID TOBAGO	2	0.14			
PEOPLES R CHINA	5	0.349	TURKEY	2	0.14			

Scholars from Madurai Kamaraj University have involved in social networking by collaborating with authors from various other countries. On the whole there are 400 collaborative publications by researchers from Madurai Kamaraj University involving 55 countries of the world. USA takes a major share of 64 publications. There are 29 collaborative publications with Japanese Researchers and 27 publications collaborated with researchers from England. Chinese collaboration is very less and is

equal to 5 publications. There is considerable collaboration with the G7 countries with total collaborative publications of 54 in number.

Table 4 Ranked authors according to publication count

Authors	Record Count	% of null	Authors	Record Count	% of null	Authors	Record Count	% of null
NATARAJAN S	154	10.762	RAJAGOPAL S	38	2.655	DHARMALINGAM K	19	1.328
PERUMAL S	117	8.176	SELVARAJ S	38	2.655	KUMAR RS	19	1.328
MUTHUSUBRAMANIAN S	77	5.381	PANDIAN TJ	33	2.306	USHA R	19	1.328
RAMAKRISHNAN V	77	5.381	UMAPATHY S	31	2.166	DHAS S A MARTIN BRITTO	18	1.258
RAJARAM RK	72	5.031	KRISHNASWAMY S	28	1.957	DHAS SAMB	18	1.258
KRISHNAKUMAR RV	70	4.892	MUTHUCHELIAN K	28	1.957	LAKSHMAN P L NILANTHA	18	1.258
PITCHUMANI K	58	4.053	SRINIVASAN N	28	1.957	LAKSHMAN PLN	18	1.258
ATHIMOOLAM S	57	3.983	IYAKUTTI K	26	1.817	SHANMUGAM G	18	1.258
RAMACHANDRAN K	57	3.983	SARASWATHI R	26	1.817	SRIRAM D	18	1.258
GUNASEKARAN P	53	3.704	UMADEVI M	26	1.817	SRIRAM DHARMARAJAN	18	1.258
NANDHINI MS	48	3.354	SIVASUBRAMANIAN S	25	1.747	YOGEESWARI P	18	1.258
MURUGESAN R	46	3.215	VELUTHAMBI K	25	1.747	YOGEESWARI PERUMAL	18	1.258
SRIDHAR B	46	3.215	NEDUNCHEZHIAN N	23	1.607	PITCHUMANI KASI	17	1.188
MARIMUTHU G	41	2.865	RAJAGOPAL K	23	1.607	SHANMUGARAJU A	17	1.188
NAVANEETHAKRISHNAN K	39	2.725	SARAVANAN S	23	1.607	SRIDHARAN V	17	1.188
RAMARAJ R	39	2.725	KUMAR RR	22	1.537	ALAGAR M	16	1.118
SRINIVASAN C	39	2.725	MOSTAD A	22	1.537	ANITHA K	16	1.118
SURESH J	39	2.725	BERTAMINI M	21	1.468	GANDHIDASAN R	16	1.118
PERUMAL SUBBU	38	2.655	KULANDAIVELU G	20	1.398	RAMESH P	16	1.118
RAJAGOPAL S	38	2.655	MUTHUSUBRAMANIAN SHANMUGAM	20	1.398	SELVAM GS	16	1.118

Natarajan S from the Department of Physics and Perumal S from the Department of Chemistry have contributed above hundred articles so far. Muthusubramanian S from the Department of Chemistry and Ramakrishnan V. from the Department of Physics. This shows that the faculty/scholars from the Departments of Physics and Chemistry have more publications than the other Departments.

Table 5 Funding Agencies for research

Funding Agencies	Record Count
UNIVERSITY GRANT COMMISSION UGC	88
DEPARTMENT OF SCIENCE AND TECHNOLOGY	70
CSIR	57
DBT GOVT OF INDIA NEW DELHI	38
MADURAI KAMARAJ UNIVERSITY	15
IRHPA PROGRAMME	9
INDIAN COUNCIL OF MEDICAL RESEARCH	5
DRS	4
GREAT WESTERN RESEARCH	3
ASIAN OFFICE OF AEROSPACE RESEARCH AND DEVELOPMENT	2

Science and technology play an increasingly important role in our everyday lives, and many of life's decisions now depend on some sort of scientific or technical knowledge. Funding plays an important role for any scientific research especially experimental oriented in typical science discipline. Kumaravel[8] had inferred that the economic growth has an impact on the research productivity of that country. This implies that that funding is a criteria for increasing the research productivity. It is found that UGC, India is the top most funding agency followed by Department of Science and Technology and CSIR.

CONCLUSIONS

The purpose of this study was to conduct a Scientometric view of Research potential of Madurai Kamaraj University in order to understand the capability and strength of the university. For this, 1431 articles published during 1999-2010 from Thompson' Web of Science database were analyzed. It is identified that the University has attained the status of University with potential for excellence by the

quantum of research publications in the recent years is on the decline. Madurai Kamaraj University will have to go a long way to prove itself to be really excellent.

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