ISSN No. 0974-035X

An Indexed, Refereed & Peer Reviewed Journal of Higher Education

Towards Excellence

UGC-HUMAN RESOURCE DEVELOPMENT CENTRE,
GUJARAT UNIVERSITY, AHMEDABAD, INDIA

SCHOLARLY PUBLICATIONS OF THE MAHARAJA SAIYAJIRAO UNIVERSITY OF BARODA, VADODARA : A BIBLIOMETRICS STUDY

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Abstract

Many evaluation studies have been carried out with the help of bibliometrics study to know the growth of research papers at national and international level, scientific productivity of authors and institutions, most relevant journals and their impact factor, citation analysis etc. This paper aimed to analysis of 2200 publications of with 23268 citations Maharaja Saiyajirao University of Baroda by using three indices, which hosted on Web of Knowledge platform i.e. Science Citation Index, Social Science Citation Index and Arts and Humanities Citation Index along with citations during the period of 2009 to 2018. Bibliometrix R tool used for summarizing results of Web of Science Data and VOSviewer used to demonstrate country's collaboration-mapping analysis.

Introduction

The Maharaja Sayajirao University of Baroda (1949) has blossomed from the Baroda College (1881) which is one of the oldest centres of learning in western India. It comprises 14 Faculties, having 90 Departments, 3 constituent colleges with 1200 well-qualified faculty members and 1500 administrative staff to facilitate the learning of more than 35,000 students having cosmopolitan life on campus and several specialized centres and institutes offering wide spectrum of courses from kindergarten to Ph.D. also with an excellent exposure to the co curricular and extracurricular experiences¹.

This article presents a study of detailed analysis of the research output of M S University of Baroda published during 2009-2018. An attempt has been made to analyse average citations per papers, H index, most prominent research areas, academicians's contribution in most popular journals, international collaboration and highly cited papers.

Literature Review

There are many statistical methods to analyse research publications through Bibliometrics: Sangwal, 2011) examined the growth of articles from selected randomly three databases out of 20 different databases in humanities social sciences and science & technology covered the period 1968–1987. In addition, author also analysed data of growth of journals, papers and authors in malaria research with publication year of journals for the period 1955–2005 and compared with the predictions of the power-law equation². (Abolghassemi Fakhree & Jouyban, 2011) made comparative study analysis among major Iranian Medical University by using Scopus to know their research performance. From this study founded that Tehran, Shiraz and Shahid Beheshti were top leading Universities on the base of high publication, number of citations and total H indices. Authors also analyzed top ten authors and top journals. Authors also concluded that Tahran University of medical Sciences performance was on top as compared with other leading medical Universities in the world and being a low research budget nation Iran performing well. Authors also suggested research collaboration to increase research

activities³. (Knievel & Kellsey, 2005) analysed and compared citations to articles published in various journals in eight humanities fields. Authors extracted 9,131 citations from journals, which published in 2002 and found that citation patterns varied widely among humanities disciplines. Authors founded that French and German language more dominant as compared to others while in some fields' citation to monographs seen less than the expected numbers⁴.

Objectives:

Objectives of this study are:

- To measure average citation and H index of publications,
- To identify most prominent 25 research areas,
- To identify University Academician's Contribution in top 10 journals,
- To explore the International collaboration
- To explore top 10 highly cited papers

Methodology:

The publications of MSU retrieved from selected three indices hosted on Web of Knowledge platform i.e. Science Citation Index, Social Science Citation Index and Arts and Humanities Citation Index. Boolean Operators was used in advance search engine to retrieve the data. A total number of 2200 publications indexed in the mentioned database, published by M S University of Baroda during the period of 2009-2018. The data collected on 19th July 2019. The published materials such as article (1935), Book Chapter (2), proceedings paper(58), Retracted Publication (1), biographical-item (2), book review (4), Correction (4), editorial material (19), letter (18), meeting abstract (69), review (86), book chapter (2) considered as research publications for this study only. The "Bibliometrix", R package used to perform various quantitative analyses on the extracted bibtex format file of Web of Science for publications and citations data. VOSviewer used to demonstrate country's collaboration-mapping analysis.

Results and discussion

Publications and Citations

A total number of 2,200 publications of M S University of Baroda indexed in Web of Science during the period of 2009- 2018. overall publications had received 23,268 citations including self-citations. The average citation per publication was 10.58. The H index of overall publications was 53. It could be observed in results that the publications in 2010 were having highest average with 17.46 citations per publication followed by 2009 with 16.04 citations.

Year	Total Publications	H index	Average Citations Per publications	Sum of Times Cited	Without Self citations
2009	207	32	16.04	3,320	3,312
2010	188	31	17.46	3,282	3,264
2011	203	28	15.61	3,169	3,149
2012	233	30	13.64	3,177	3,141
2013	242	26	12.76	3,087	3,056
2014	241	24	12.05	2,903	2,871
2015	236	20	7.47	1,762	1,721

2016	214	16	5.82	1,245	1,236
2017	205	14	4.15	851	835
2018	231	9	2.04	472	434
Total	2200	53	10.58	23,268	20,554

University Contribution in most prominent 25 Research Areas

University has contributed in various research areas, In this study, We have extracted most prominent 25 research areas from Web of Science platform, where University has conducted research work in mention below subject areas. It could be observed that University academicians have highest publications published in the subject of Chemistry and least publications published in the subject of Food Science Technology as per mentioned below results of 25 research areas.

Research Areas	No. of Articles
Chemistry	609
Pharmacology Pharmacy	306
Physics	292
Materials Science	218
Engineering	199
Biochemistry Molecular Biology	151
Science Technology Other Topics	115
Geology	87
Biotechnology Applied Microbiology	84
Crystallography	74
Environmental Sciences Ecology	70
Plant Sciences	65
Polymer Science	61
Microbiology	53
Optics	46
Neurosciences Neurology	42
Cell Biology	41
Energy Fuels	40
Nuclear Science Technology	38
Mathematics	36
Agriculture	34
Toxicology	32
Water Resources	29
Endocrinology Metabolism	28
Food Science Technology	27

University Academician's Contribution in top 10 Journals

University academicians have published their various research papers in journals related with their research areas. In this study, We have extracted top 10 journals during the period of 2009-2018 from Web of Science platform. It could be observed that University academicians have highest publications published in the Physical Review C Journal and least publications published in the Synthetic Communications Journal. Journals' H index, G index and M index extracted from the Bibliometrix: R package. Where, H index intends to express the journal's number of articles (h) that have received atleast (h) citations; G index intends to quantify productivity in science based on their publication record; and M-Index is the H-index divided by the number of years that Journals have been published. It could be observed that Physical Review C Journal has highest citations, H index, G index and M index as compared to other journals in mentioned below results.

Journals	No. of Articles	Time cited	H-Index	G-Index	M-Index
Physical Review C	41	556	14	22	1.2727273
RSC Advances	40	454	11	19	1.375
Current Science	27	130	7	10	0.6363636
Molecular Crystals And Liquid Crystals	25	194	8	13	0.7272727
Journal Of The Geological Society Of India	24	142	7	10	0.6363636
Plos One	23	237	9	14	0.8181818
Aaps Pharmscitech	22	372	10	19	0.9090909
Polyhedron	21	283	10	16	0.9090909
Tetrahedron Letters	16	143	7	11	0.7
Synthetic Communications	15	65	4	7	0.3636364

International Collaboration

International collaboration based on publications which reveals that university academicians published their publications in association with other countries. We have extracted 10 countries along with number of publications from Web of Science. It could be observed that highest publications of Maharaja Sayajirao University of Baroda associated with USA as compared to other countries. VoSViewer used to demonstrate country's collaboration-mapping network. This network intends to show how many countries associated together for publications.

Countries	Publications
USA	113
Germany	35
England	26
Peoples R China	26
Spain	25
South Korea	24
Brazil	23
France	21
Canada	17

Japan	15
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Top Ten Highly Cited Papers

Sl. No.	Titles	Times Cited
1	Upadhyay, Kamal K.; Bhatt, Anant N.; Mishra, Anil K.; et al. (2010). The intracellular drug delivery and anti tumor activity of doxorubicin loaded poly(gamma-benzyl L-glutamate)-b-hyaluronan polymersomes. Biomaterials, 31 (10), 2882-2892	235
2	Upadhyay, Kamal K.; Bhatt, Anant N.; Mishra, Anil K.; et al. (2014). PEG - A versatile conjugating ligand for drugs and drug delivery systems, Journal of Controlled Release, 192, 67-81	231
3	Yewale, Chetan; Baradia, Dipesh; Vhora, Imran; et al. (2013). Epidermal growth factor receptor targeting in cancer: A review of trends and strategies. Biomaterials, 34 (34), 8690-8707	191
4	Valodkar, Mayur; Modi, Shefaly; Pal, Angshuman; et al. (2011). Synthesis and anti-bacterial activity of Cu, Ag and Cu-Ag alloy nanoparticles: A green approach. Materials Research Bulletin, 46(3), 384-389	162
5	Upadhyay, K. Kumar; Le Meins, J. -F.; Misra, A.; et al. (2009). Biomimetic Doxorubicin Loaded Polymersomes from Hyaluronan-block-Poly (gamma-benzyl glutamate) Copolymers. Biomacromolecules, 10 (10), 2802-2808	149
6	Pal, Angshuman; Shah, Sunil; Devi, Surekha (2009). Microwave-assisted synthesis of silver nanoparticles using ethanol as a reducing agent. Materials Chemistry and Physics, 114 (2-3), 530-532	142
7	Seju, U.; Kumar, A.; Sawant, K. K. (2011). Development and evaluation of olanzapine-loaded PLGA nanoparticles for nose-to-brain delivery: In vitro and in vivo studies. Acta Biomaterialia, 7 (12), 4169-4176	135
8	Chandra, Sourov; Patra, Prasun; Pathan, Shaheen H.; et al. (2013). Luminescent S-doped carbon dots: an emergent architecture for multimodal applications. Journal of Materials Chemistry B, 1(18), 2375-2382	130
9	Tripathi, Avinash C.; Gupta, Shiv Ji; Fatima, Gul Naz; et al. (2014). 4-Thiazolidinones: The advances continue. European Journal Of Medicinal Chemistry, 72, 52-77	127

10	Manjappa, Arehalli S.; Chaudhari, Kiran R.; Venkataraju, Makam P.; et al. (2011). Antibody derivatization and conjugation strategies: Application in preparation of stealth immunoliposome to target chemotherapeutics to tumor. Journal of Controlled Release, 150(1), 2-22	121
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Conclusions

As mentioned above, the presented study explored the various bibliometrics parameters of publications of M S University of Baroda published during 2009-2018, which indexed in Web of Science Core Collection. 2200 publications indexed which were having a total number of 23,268 citations. The average citation per publication was 10.58. A total number of 609 research papers published in Chemistry research area. 41 publications of University have published in the Physical Review C Journal and that journal 556 times cited, its h index is 14 and g index is 22 and m index is 1.2727273. USA country associated with Maharaja Sayajirao University of Baroda published highest publication during the research period. Top ten highly paper cited also examined.

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