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“RESEARCH OUTPUT OF RESEARCH SCHOLARS OF CHEMISTRY, SAURASHTRA UNIVERSITY DURING 2011-2015: A BIBLIOMETRICS STUDY”

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ABSTRACT:

Research weightage 30% in ranking of higher education system and research is one of the main function of University. Bibliometrics is one of the most useful technique to know the research output of individuals or institutions. In this study, researcher observed research output by using Bibliometrics techniques. Researcher analysed 388 published research articles of research scholars of Department of Chemistry, Saurashtra University during 2011 to 2020. Research scholars published these 388 research articles during their Ph. D. degree. All the research articles are published in English language. Total 294 research articles are published in the subject of Organic Chemistry. Research scholars of Chemistry prefer to publish their research work in multiple authorship and international journals. All the research articles are published in multiple authorship and 314 research article published in international journals. Most preferred journal is “Molecular Crystals and Liquid Crystals” and most preferred publisher is “Taylor and Francis Group” among the research scholars of Chemistry.



KEY WORDS: Bibliometrics, Research Output, Chemistry, Saurashtra University.

INTRODUCTION:

According to Abbott and Doucouliagos (2004) “Research plays a vital role in promoting the prosperity of a nation and the well-being of its citizen in this knowledge based era and Universities are playing the role of engines to generate the knowledge by doing research and be a part of global development by promoting the research”. Research can bring tremendous change in society as well as in the field of knowledge. Research plays an important role in credibility, recognition and increase ranking of any higher academic institution. In present scenario, evaluation and improvement of research activities and ranking system in higher education become very important, in India and it is useful in improving the rating of our higher education systems in global university ranking.

Research is considered as a careful study and research output is the system of the University or any academic and research organisation uses to record its researcher’s research output and activities like published research articles, letters, theses, books, book chapters, conference proceedings, presentations etc. Turnage (1990) defines research output as, “relationship between the outputs generated by a system and the inputs provided to create those outputs. It may also include the term

'efficiency' and more importantly 'effectiveness', which measures the total output or results of performance". Research output and research productivity are the synonym.

Research output is useful for institute as well as researchers also. It will be useful for researchers in funding, promotion, and getting awards but it is very important for any organisation in ranking and funding. In Forbes Asia, Nello Angerilli (2013) said that the "ranking agency measure the importance of research outputs by evaluating where and how often faculty and research scholars of any academic institution publishes." Ranking agencies does not only see the number of publications but also see the quality of journals and where published. Top ranked journals improves institutional ranking. Various techniques of Bibliometrics is widely used to identify, review, monitor and measure research output or productivity individual, group, institution or country.

Through this article, an attempt has been made to observe the research competitiveness of the department of chemistry, Saurashtra University of their research output during 2011 to 2020. Research output of research scholars in the form of published research publications during their Ph. D. study and these published research work was also aimed to evaluate the quantity of research. The Department of Chemistry, Saurashtra University was established in 1980 with courses of "Masters of Science" and "Doctor of Philosophy" in four specializations of Chemistry: Organopharmaceutical Chemistry, Pharmaanalytical Chemistry, Physical Chemistry and Inorganic Chemistry. Various sophisticated equipment of the various laboratories with expert teaching and supporting staff, number of national and international seminars, conferences and workshops, number of registered patents, visits of many national and international academician, scientists and industrialists, successful completion of various research projects funded by various govt. agencies like, UGC, CSIR, BRNS, DST, GUJCOST est., some projects completed with the collaboration of private industries department has been awarded by "Centre of Excellence". And today Department of Chemistry is one of the top departments in the Gujarat.

REVIEW OF LITERATURE:

Sevukan and Sharma (2008) used bibliometrics technique to analyse research performance of faculties of Biotechnology department of twenty Central Universities of India. Researcher analysed total 345 publications retrieved from PubMed and SCIE. Researcher found that the faculties of biotechnology published their research in various form like articles, reviews, letters and editorial materials and the growth of literature has been increased.

Maharana and Sethi (2013) studied scientific research output of students, researchers and faculty members from Science and Technology of Sambalpur University from 2007 to 2011. Main objective of this study was to analyse research activities of the Sambalpur University indexed by ISI Web of Science. Total 170 research publications were published during this time and annual growth rate was 30.53% observed. These publications were 541 times cited. Students, Researchers and faculty members were prefer to publish their research publication in multiple authorship and published it with foreign publishers. Chemistry was the most prolific department of Sambalpur University.

Pratap and Gupta (2009) analysed research output of 25 Indian Universities during 1999 to 2009 to rank the quantitative and qualitative research performance. Total 59685 research papers were published by these universities but average 1200 papers per university was downloaded from SCOPUS database. Research output of these 25 universities increased from 17% (22173 research papers) in 1999 to 2003 to 19.31% (37512 research papers) in 2004 to 2008.

Lalrindika and Shukla (2019) analysed research output of 67 faculty members of school of Social Sciences and Education and Humanities of Mizoram University for the last five years. The Data was collected through questionnaire and tabulated in MS-Excel. Faculty Members preferred to publish their research work in the form of journal article, book, book chapter, conference papers, and text books. Poor internet connectivity, lack of financial support from university and funding/ sponsoring agency were the factors to affecting the research work.

Kappi and Biradar (2019) assessed the scientific research output through Bibliometrics analysis of Kuvempu University during 1990 to 2019. The data was collected from Web of Science and analysed to know the type of document, author productivity, geographical and language collaboration.

Researcher found that the highest publication 136 was done in the year 2012 and Electrochemistry was the most preferred research area. Research scholars of Kuvempu University prefer English Language to publish their research work in form of journal article (97.01%) and prefer multiple authorship (99.39%).

OBJECTIVES OF THE STUDY:

The primary purpose of the study is to analyse the research competitiveness and publication trends among the research scholars of Department of Chemistry, Saurashtra University during 2011 to 2020. Through this analysis, an effort has been made to:

1. To identify the growth trends of the research work in subject of the Chemistry in Saurashtra University.
2. To study the authorship pattern and most prolific author.
3. To study publication pattern and rank the national and international journals for publishing their research work.
4. To study the Country and Publisher wise collaboration to publish the research articles of the research scholars of Chemistry.

METHODOLOGY AND DATA ANALYSIS:

The data source for this study is bibliographic details of published research articles of research scholars of the department of Chemistry, Saurashtra University during the year 2011 to 2020 to fulfil their Ph. D. degree. The bibliographic details of each record like, author/ researcher, title of document, place and publishing details, year of publication, Language, status of the journal etc. recorded in the excel spread sheet and then data was analysed as per the objective of the study. During the year 2011-2020, during this time, total 151 research scholars have completed their Ph. D. degree, 119 research scholar's publication details are available, and details of 32 research scholars are not available. 119 research scholars are published total 388 research articles in various journals, so average 3.26 average research articles published by the research scholars of Chemistry. All the 388 research articles are published in English Language. Detailed analysis is as under,

1.1 Subject wise Distribution of Published Research Articles:

Table: 1 Subject wise Distribution of Published Research Articles

Sr. no.	Subject	Number of Research Articles	Percentage
1	Analytical Chemistry	41	10.57
2	Inorganic Chemistry	22	5.67
3	Organic Chemistry	294	75.77
4	Physical Chemistry	31	7.99
Total		388	100

Table 1 shows subject wise distribution of published research articles of research scholars of chemistry during their Ph. D. degree. During the year 2011 to 2020, maximum 294 (75.77%) research articles are published in Organic Chemistry, than 41 (10.57%) research articles are published in Analytical Chemistry and 31 (7.99%) research articles are published in Physical Chemistry.

1.2 Authorship Pattern of Research Publication and Most Prolific Authors:

Table: 2 Authorship Description of Published Research Articles

Sr. no.	Authorship Description	Number of Research Articles	Percentage
1	Single Author	0	0
2	Two Authors	96	24.74
3	Three Authors	78	20.11
4	Four and More Than Four Authors	214	55.15
Total		388	100

Authorship Pattern is indicated in table no. 2. Researcher found that the research scholars of chemistry prefer multiple authorship, no research article found in single authorship. 96 research articles published with two authors, 78 research articles published with three authors and 214 (55.15%) research articles published with four and more than four authors. Researcher analysed 388 research articles and prepared the rank list. According to this rank list Chopda Pooja is on first rank with ten publications and Dravadi Jalant is on second rank with 8 publications. Dodiya Dipti, Savant Mahesh, Dodiya Bhavesh, Kotadiya Vipul, Bholu Gaurav and Ranchchh Avani are on third rank with seven publications.

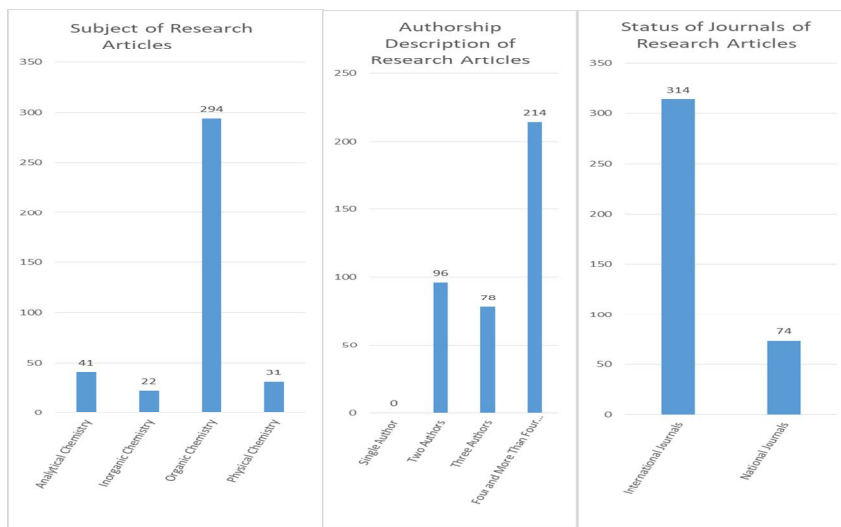
1.3 Publication Trend/ Status of Journals for Research Publication:

Table: 3 Status of Journals

Sr. No.	Status of Journals	Number of Publication	Percentage
1	International Journals	314	80.93
2	National Journals	74	19.07
Total		388	100

Table no. 3 shows that research scholars of Chemistry prefer International publications to publish their research articles. Total 80.93% (314) research articles are published in international journals and only 19.07% (74) research articles are published in national journals. United Kingdom and United States of America are the most preferred country to publish the research articles.

A graphical representation of the subjects, authorship pattern and status of the journals of published research articles is given in below graph.



1.4 Rank list of journals and Publishers:

Table: 4 Rank list of Journals and Publishers

Rank	Name of the Journal	Research Articles	Name of publisher	Research Articles
1	Molecular Crystals and Liquid Crystals	36	Taylor and Francis Group	47
2	World Scientific News	34	Scientific Publishing Group	34
3	International Letters of Chemistry, Physics and Astronomy	28	Elsevier	33
4	Journal of Chemical and Pharmaceutical Research	14	SCI Press Ltd.	28
5	Chemistry and Biology Interface	11	Wiley Publishing Company	22
6	International Journal of Chemtech Research	11	Springer Science	17
7	Bioorganic and Medicinal Chemistry Letters	10	Journal of Chemical and Pharmaceutical Research	14
8	Journal of Polymer Materials	9	Royal Society of Chemistry	13
9	Journal of Heterocyclic Chemistry	8	Trade Science	13
10	Chemistry Select	7	Sphinx Knowledge House	11

Rank list of Journal and Publisher is shown in table no. 4, Research scholars of chemistry published 388 research articles in total 116 journals. Researcher prepares the rank list and observed that the "Molecular Crystal and Liquid Crystals" journal is on first rank with 36 publications, "World Scientific News" journal is on second rank with 34 publications and "International Letters of Chemistry, Physics and Astronomy" Journal is on third rank with 28 publications. According to Publisher rank list ranked publishers are followed "Taylor and Francis Group", "Scientific Publishing House" and "Elsevier".

CONCLUSION:

In this study, the analysis of research output of research scholars of Department of Chemistry, Saurashtra University from 2011 to 2020 shows that total research output is 388 research articles. 75.77% research articles has been published in the subject of Organic Chemistry. Research scholars of chemistry prefer to publish their research work in multiple authorship, 100% research articles are published in multiple authorship and they prefer to publish their work in International journals, total 80.93% publication are published in international journals and "Molecular Crystals and Liquid Crystals", "world Scientific News" and "International Letters of Chemistry, Physics and Astronomy" are the most preferred journals to published their research articles. These results will be useful for researchers of chemistry as well as library professionals in selection, acquisition of library materials and selection of research subjects and publishing details. It will be useful in design, develop and conduct research work in future.

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