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Measuring Scholarly Traits of a University: A Scientometric Study of the Scholarly Publications of the Bharathidasan University

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ABSTRACT

The present research analysed the research outcome of Bharathidasan University in terms of publication output as classified in the new subject classification of Web of Science Database as Macro, Meso, Micro topics. The analysis could reveal that Bharathidasan University has contributed into all the 10 Macro 326 Meso, 2500 Micro as classified by the source database. While the researcher taken into consideration of the top 20 areas of research where Bharathidasan University faculty and researchers pursued and published. In addition, frequency and percentage analysis, the analytical tools, VOSviewer, Histcite, Excel have been used. The research trends in terms of quantum of publications, the Journal source and funding agencies have been correlated at national level, while it varies significantly at Global Level. The global output of the identified 20 highly concentrated research areas of Bharathidasan University, India has had a dominant position as it holds 6th position in two of the subject categories. All the top 5 major contributing subject areas were India is in fourth place among the Asian nations.

Keywords: Subject categories; Research productivity; Citation topics, Funding agencies; Micro citation topics; Meso citation topics

1. INTRODUCTION

Scientific and research measurement studies become indispensable for the assessment of institutional performance, which enable the stakeholders to make the potentials of the particular institution where the students can enroll for their academic and further education and also the National Governments, Research Organisations, and International Organisations prefer to have inputs to describe the funding and other support to encourage the research in different subject domains and also fill the gap between the regions in terms of the scientific research growth and development. The scientometric studies is of very much relevant in the present global context as Times Higher Education Ranking and QS World Universities Ranking, NAAC, NIRF, and any other national and International ranking framework consider the publication output and publication metrics as one of the key parameter. In this context, the present study aimed at analysing the research areas proliferation in Bharathidasan University as the outcome of analysing the publication output documented in the internationally leading reputed scientific scholarly indexing and citation database web of science. As the micro, meso and macro citation topics of the publications categorised as one of the emerging scientometrics aspect, the researchers aimed at analysing the citation impact of the publications in various micro areas of research carried out in Bharathidasan University.

2. LITERATURE REVIEW

The heterogeneous scientometric assessment pattern of the first 50 volumes International Journal Scientometrics during 1978 to 2001 has been studied and the findings of the study shows that Netherlands, India, France and Japan are on the rise with domination of single authored papers while multi-authored papers are gaining impetus[2]. As of the present study analysed the annual publications and citation trends, top ten most cited papers, influential papers in their first three years after publication, contributing authors, funding agencies, and contributing journals[6].

Data for the analysis is extracted from the scopus database. VOSviewer software is used to map different bibliometric indicators such as bibliographic coupling and co-occurrence. This study identifies the most productive countries, authors, journals, and the most prolific publications in knowledge transfer research during 2010-2019. Moreover, it also identifies the most popular themes and suggests some future directions where the present study used web of science as source database[4]. A quantitative review of 3685 journal articles related to international students

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published between 1900 and 2018. It is discovered from the study that Australia, the U.K., and the USA were the most prominent producers of research in the field, with cross-cultural adjustment, mental health problems, second-language acquisition, intercultural development, and student migration being the most studied topics. Social integration, graduate employability, and student satisfaction were identified as emerging trends [5]

3. OBJECTIVES OF THE STUDY

The main objective of this study is focused on the research areas, as reflected in the publications' output during 1989-2023. In particular, the study analyses about: (i) Research output, its growth pattern and rank; (ii) The publications' productivity and impact on leading institutions and; (iii) The characteristics of the most prolific authors; (iv) Most productive Journals. The study is also aimed that

1. Identifying dominant research areas and specialisation of the research in Bharathidasan University.
2. Measures the research literature output as to the research areas and research specialisations.
3. Most productive authors and author productivity pattern in various research areas of Bharathidasan University.
4. To find out highly productive journals contributing to the prominent research areas of Bharathidasan University.
5. To know the highly productive research areas in national and international context
6. To reveal the areas and research behavior pattern pertinent to Bharathidasan University.

4. DATA ANALYSIS AND INTERPRETATION

The researcher intend to study the publications output on chosen field "Research areas and Research Specialisation in Bharathidasan University" from web of science database also as it is being one of the major citation and indexing database that recognised among the academic and research community across the globe also it will give a comparative outline of the indexed literature on research areas and related studies. Accordingly, an annex of the research publications indexed in web of science classified in to the "Research areas and Research Specialisations" were analysed and tabulated with relevant inferences.

As one of the emerging indicator, the web of science classified the subject areas as Macro, Meso and Micro level specialisations. Accordingly, analysis as to the research specialisations of Bharathidasan University has been made. It is found that all the ten areas listed as macro topics. in which the Bharathidasan University research outcome prevailed, while Meso, there are 200 Meso topics in which Bharathidasan University research carried out. While there are 1500 micro level research specialisations categorised in where also Bharathidasan University research has been documented.

5. RESULTS

5.1 Top Twenty Macro, Meso and Micro Topics of Research in Bharathidasan University

The analysis reveals that the top 20 macro topics of research as to the data is of Chemistry, Mathematics, Agriculture, Environment & Ecology and Physics and Clinical & Life Sciences. Only five macro areas in which the top 20 research outcome has been brought out and the Macro topic Chemistry (2) has six Meso topics, of which Inorganic and Nuclear Chemistry has highest publications (582), Followed by Synthesis (414), Nano Particles (311), University research on the Macro topic Mathematics (9) has had only one Meso level topic, which is dynamical systems & time dependence and had 245 publications as evident from the table 1.

Macro Topic (3) Agriculture, Environment & Ecology (225) has had the representation of (6) Meso topics among top twenty areas of higher level publication outcome. Crop Science (225) has the highest publication outcome followed by Phytochemicals (189), Marine Biology (167), as Meso topics of the research.

The macro topic Physics (5) has had 4 Meso topics as top twenty research area wise Solitons (174), Quantum Mechanics (162), Applied Physics (80), Electromagnetism (63) followed by the Meso topics of Molecular & Cell Biology - Cancer, Autophagy & Apoptosis (69) under the Macro Topic Clinical & Life Sciences (1).

5.2 Citation Topics on Research Specialisation of Bharathidasan University

Figure 1 enable the visualisation of Macro, Meso citation topics of top two research areas and research specialisation are reflected in Bharathidasan University

It is found that there are 200 numbers of Micro areas, where the top twenty Meso level research publications spreaded out as visualise the Figure 2.

The web of science categories the Bharathidasan University research documented into 176 areas. Of which, Chemistry Multidisciplinary (568), Materials Science Multidisciplinary (534) Biochemistry Molecular Biology (473) Crystallography (469) and Physics Applied (413) are high productive research areas. The top twenty areas alone contributed 3775 number of publications of the total research outcome of 6275.

5.3 Distribution of Prolific Research Areas of Bharathidasan University and Highly Contributed Sources and Funding Agencies

The overall analysis of Bharathidasan university research areas and research specialisations mapped by the citation topics revealed that the Bharathidasan University research outcome got cited and have the cited references on 20 Macro Topics, 20 number of Meso Topics spreaded into 251 number of Micro level Specialisations as depicted in the Table 2.

It is found that "Acta Crystallographica Section C Structural Chemistry" has been contributed 98 publications

Table 1. Top twenty Macro, Meso and Micro topics of research in Bharathidasan University

S. No.	Macro ID	Macro topic	Meso ID	Meso topic	Records
1	2	Chemistry	22	Inorganic & Nuclear Chemistry	582
2	2	Chemistry	1	Synthesis	414
3	2	Chemistry	67	Nanoparticles	311
4	2	Chemistry	74	Photocatalysts	275
5	2	Chemistry	259	Optical Chemistry	252
6	9	Mathematics	143	Dynamical Systems & Time Dependence	245
7	3	Agriculture, Environment & Ecology	4	Crop Science	225
8	3	Agriculture, Environment & Ecology	16	Phytochemicals	189
9	5	Physics	23	Solitons	174
10	3	Agriculture, Environment & Ecology	2	Marine Biology	167
11	5	Physics	56	Quantum Mechanics	162
12	3	Agriculture, Environment & Ecology	6	Herbicides, Pesticides & Ground Poisoning	131
13	2	Chemistry	123	Protein Structure, Folding & Modelling	113
14	3	Agriculture, Environment & Ecology	171	Photo productivity	96
15	2	Chemistry	59	Pigments, Sensors & Probes	87
16	5	Physics	77	Applied Physics	80
17	3	Agriculture, Environment & Ecology	83	Bioengineering	75
18	1	Clinical & Life Sciences	25	Molecular & Cell Biology - Cancer, Autophagy & Apoptosis	69
19	2	Chemistry	62	Electrochemistry	65
20	5	Physics	88	Electromagnetism	63

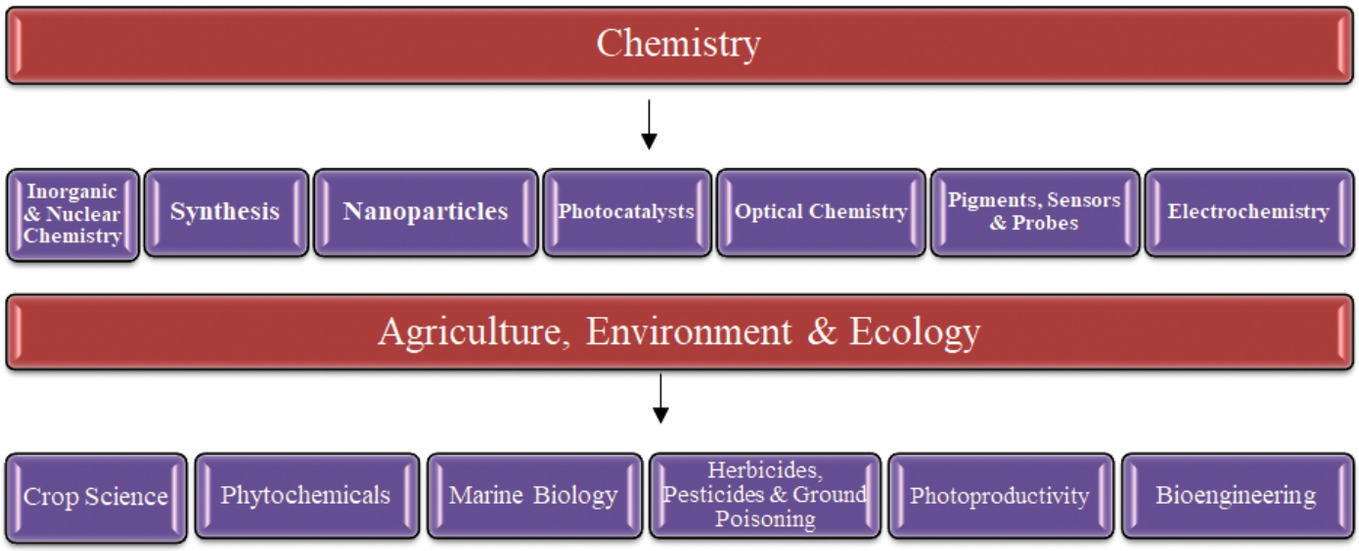

Figure 1. Example of Macro, Meso topics of top two research areas and research specialisation of Bharathidasan University.

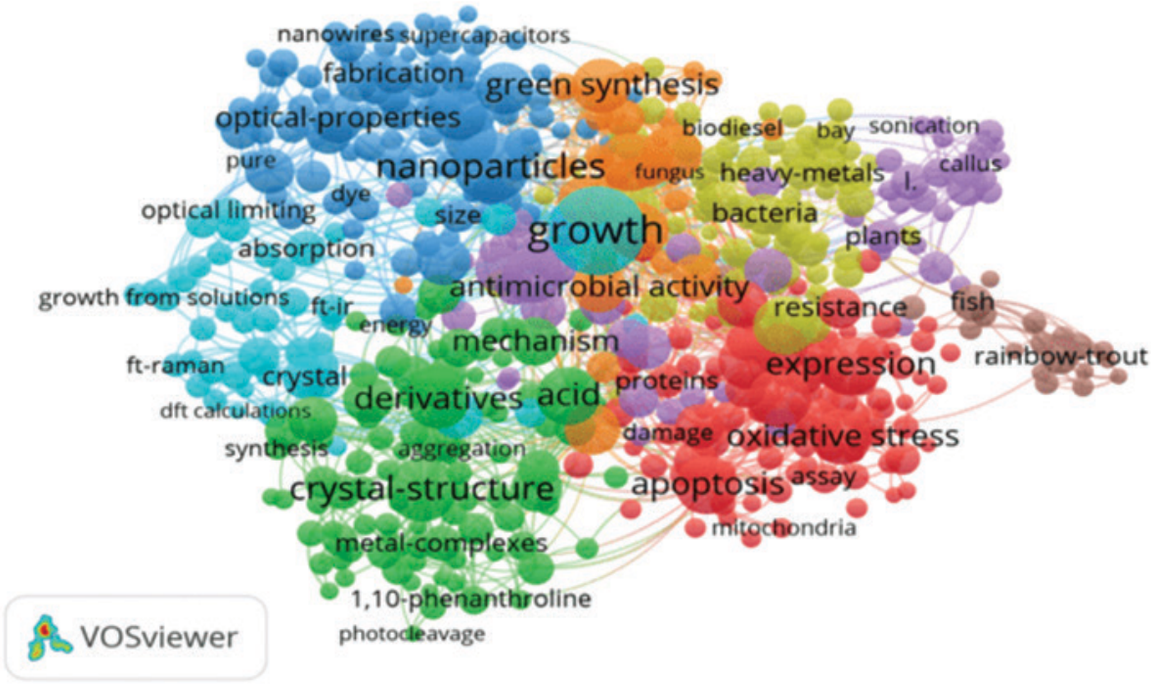

Figure 2. Micro topics on research specialisation of Bharathidasan University.

while the highest sponsored research funding is of department of science and technology with 107 publications. The share as the evidence as the major funding resource for all the top 20 areas of research as department of science and technology, India. Since, it is the highest funding resource for 14 of the top 20 research areas listed. The remaining top funding source is of University Grants Commission India as it has contributed the 85 and 40 publications respectively. The 2nd and 3rd major research areas are of Material Science Multidisciplinary (1,26,427), Biochemistry Molecular Biology (60,696) and Crystallography (17,418). While the highest journals source contributed to the top 20 research areas completely varies as the 17 different journals in which the highest number of publications pertinent to respective subject areas has been preferred by the Bharathidasan University Researchers.

It is found that Journal of Materials Science Materials in Electronics remains as top contributing journal as remain as highly productive sources the four research areas such as Materials Science Multidisciplinary, Physics Applied Physics Condensed Matter, Marine Freshwater Biology, while UGC remains top contributed for four research areas of 20 highly productive research domains of Bharathidasan University. Council of Scientific Industrial Research CSIR India as third major funding source as 41 publications brought out as sponsored research output in the Marine fresh water biology.

5.4 Distributions of Publication Outcomes in the Highly Productive Research Areas in Indian Context

Table 3 shows the publications outcome of the predefined research areas as figured out in table in line with Bharathidasan University, it is found that chemistry multidisciplinary area is with 1,11,458 publications. Followed by material science multidisciplinary with 1,26,427 publications while the chemistry physical and physics multidisciplinary is occupied in third and fourth place with 81,541 and 79,815 publications in the top 20 research areas. In terms of publication titles the Journal of Material Science Materials in Electronics has appeared in 4 places in the top 20 research areas dominating with highest number of publications collectively while the current science journal is dominating with 18,817 publications under multidisciplinary research area

With respect to funding agencies, the majority of the sponsorship research outcomes are supported by Department of Science Technology India holding 14 places out of 20 while remaining 6 research areas where higher sponsorship of research and publications outcome by CSIR, India.

It is found that in comparison with Bharathidasan University the distribution of publications outcomes on the predefined research areas in Indian context is dominating in terms of numbers also with respective to journal wise distribution of publications the trend prevails the same on par with the distribution of publications outcomes on predefined research area in Bharathidasan university context. While the numbers of the publications are significantly varying. it is discovered from the table that major funding agencies supported on the predefined research areas in the Indian context is two agencies namely Department of Science Technology, India and Council of Scientific Industrial Research CSIR, India. It is noted that department of Science Technology, India is collectively dominating in 14 research areas of the overall 20 areas undertaken while the remaining 6 areas are sponsored by CSIR, India. The same trend pertinent to Bharathidasan University Research output also.

Table 2. Distribution of prolific research areas of Bharathidasan University and highly contributed sources and funding agencies

S. No.	Research area	Records	Journal	Records	Funding agencies	Records
1	Chemistry Multidisciplinary	568	Acta Crystallographica Section C Structural Chemistry	98	DST India	107
2	Materials Science Multidisciplinary	534	Journal of Materials Science Materials in Electronics	101	DST India	115
3	Biochemistry Molecular Biology	473	International Journal of Biological Macromolecules	44	UGC India	85
4	Crystallography	469	Acta Crystallographica Section E Crystallographic Communications	218	UGC India	40
5	Physics Applied	413	Journal of Materials Science Materials in Electronics	101	DST India	93
6	Chemistry Physical	408	Journal of Molecular Structure	63	DST India	102
7	Environmental Sciences	352	Marine Pollution Bulletin	43	UGC India	63
8	Physics Condensed Matter	334	Journal of Materials Science Materials in Electronics	101	DST India	74
9	Chemistry Inorganic Nuclear	300	Dalton Transactions	41	DST India	83
10	Physics Mathematical	293	Physical Review	79	DST India	101
11	Biotechnology Applied Microbiology	287	Applied Biochemistry and Biotechnology	37	UGC India	40
12	Physics Multidisciplinary	287	Physics Letters A	58	DST India	82
13	Multidisciplinary Sciences	286	Current Science	99	DST India	41
14	Chemistry Organic	257	Tetrahedron Letters	42	DST India	53
15	Plant Sciences	222	In Vitro Cellular Developmental Biology Plant	26	UGC India	25
16	Mathematics Applied	176	Chaos	35	DST India	38
17	Marine Freshwater Biology	160	Marine Pollution Bulletin	43	CSIR India	41
18	Microbiology	157	Microbial Pathogenesis	36	DST India	19
19	Engineering Electrical Electronic	156	Journal of Materials Science Materials in Electronics	101	DST India	17
20	Biophysics	143	Colloids And Surfaces B Bio interfaces	31	DST India	40

5.5 Distributions of Publication Outcomes in the Predefined Research Area in the Global Context

Table 4 shows the distribution of publications outcomes in predefined research areas in line with Bharathidasan University research area in the global context. Chemistry multidisciplinary research area is dominating the overall publication count with 25,73,945 publications. It is followed by material science multidisciplinary with 22,75,217 publications. The biochemistry molecular biology is in third position with 22,25,056 publications while the research areas like Crystallography, Physics Mathematical, Marine Fresh Water Biology and Chemistry Inorganic Nuclear areas are with less number of publications in the top 20 research areas are undertaken in global context.

The journal wise distribution of publications in the research areas shows that the abstract of papers of the American Chemical Society is top with 4,49,742 publications in following with PLOS One Journal and FASEB Journal with 2,65,670 and 2,42,177 publications respectively. It is to note that the biophysical journal and physical review B

Table 3. Distributions of publication outcomes in the highly productive research areas in Indian context

S. No.	Research areas	Records	Journal	Records	Funding agencies	Records
1	Chemistry Multidisciplinary	1,11,458	RSC Advances	8,823	DST India	18,984
2	Materials Science Multidisciplinary	1,26,427	Journal of Alloys and Compounds	5,587	DST India	16,205
3	Biochemistry Molecular Biology	60,696	International Journal of Biological Macromolecules	3,829	CSIR India	7,590
4	Crystallography	17,418	Polyhedron	2,362	DST India	2,390
5	Physics Applied	72,127	Journal of Materials Science Materials in Electronics	5,080	DST India	8,690
6	Chemistry Physical	81,541	Journal of Alloys and Compounds	5,587	DST India	13,704
7	Environmental Sciences	55,421	Environmental Science and Pollution Research	3,434	DST India	3,478
8	Physics Condensed Matter	50,124	Journal of Materials Science Materials in Electronics	5,080	DST India	5,663
9	Chemistry Inorganic Nuclear	26,196	Dalton Transactions	2,462	DST India	4,999
10	Physics Mathematical	11,821	Physical Review	3,098	DST India	1,227
11	Biotechnology Applied Microbiology	35943	Bioresource Technology	3,084	CSIR India	3,238
12	Physics Multidisciplinary	79,815	Journal of Materials Science Materials in Electronics	5,080	DST India	8,893
13	Multidisciplinary Sciences	57,103	Current Science	18,817	DST India	3,663
14	Chemistry Organic	47,769	Tetrahedron Letters	6,216	CSIR India	10,826
15	Plant Sciences	35,539	Journal of Ethnopharmacology	1,549	CSIR India	2,358
16	Mathematics Applied	19,084	Applied Mathematics and Computation	1,356	DST India	1,141
17	Marine Freshwater Biology	6,080	Aquaculture	677	CSIR India	471
18	Microbiology	51,485	Bioresource Technology	3,084	CSIR India	3,084
19	Engineering Electrical Electronic	73,394	Journal of Materials Science Materials in Electronics	5,080	DST India	4,150
20	Biophysics	17,248	Journal of Biomolecular Structure Dynamics	2,484	DST India	2,142

are in the fourth and fifth place in distribution of research publication in predefined research areas in the global context.

In terms of the journals trend has been varied with Bharathidasan University and Indian context, the Journal Physical Review B is dominating four research areas namely Material Science Multidisciplinary, Physics Applied, Physics Condensed Matter, Physics Multidisciplinary with same publication distribution of 1,72,300 publications.

It is also found that the journal published in the Indian context is significantly differ with global context both in terms of titles and the publication counts.

The predominant funding agencies are of National Natural Science Foundation of China NSFC with overall sponsorship of the research and publications on the predefined research areas holding 16 places out of top 20 research areas undertaken while the United States Department of Health Human Services holding the remaining 4 positions with sponsoring the research for 6, 00,000 publications in the global context.

From the Table 4, it is discovered that from the top 20 predefined research areas undertaken from the Bharathidasan university when compared with global context out of 20 research areas 10 research areas have more than 10,00,000 research publications. Indian and Bharathidasan University outcome mainly from the sponsored research by Indian organisation and agencies, which need to be addressed to make efforts to explore International research findings of high rate.

Table 4. Distributions of publication outcomes in the predefined research area in the global context

S. No.	Research aeas	International	Journal	Records	Funding agencies	Records
1	Chemistry Multidisciplinary	25,73,945	Abstracts of Papers of the American Chemical Society	4,49,742	NSFC	3,14,596
2	Materials Science Multidisciplinary	22,75,217	Physical Review B	1,72,300	NSFC	366,188
3	Biochemistry Molecular Biology	22,25,056	FASEB Journal	2,42,177	U.S. HHS	3,65,490
4	Crystallography	2,57,684	Journal of Crystal Growth	30,365	NSFC	18,764
5	Physics Applied	17,38,174	Physical Review B	1,72,300	NSFC	2,13,833
6	Chemistry Physical	15,64,369	Journal of Chemical Physics	81,840	NSFC	224,413
7	Environmental Sciences	14,02,537	Sustainability	57,935	NSFC	1,49,542
8	Physics Condensed Matter	9,41,871	Physical Review B	1,72,300	NSFC	91,577
9	Chemistry Inorganic Nuclear	3,92,906	Inorganic Chemistry	46,264	NSFC	35,815
10	Physics Mathematical	2,83,139	Physical Review E	65,286	NSFC	21,804
11	Biotechnology Applied Microbiology	7,56,154	Applied And Environmental Microbiology	28,624	NSFC	56,546
12	Physics Multidisciplinary	16,12,666	Physical Review B	1,72,300	NSFC	2,04,466
13	Multidisciplinary Sciences	14,53,965	PLOS One	2,65,670	U.S. HHS	153,862
14	Chemistry Organic	5,93,915	Tetrahedron Letters	61,875	NSFC	49,294
15	Plant Sciences	7,26,014	Phytopathology	27,491	NSFC	50,878
16	Mathematics Applied	6,11,133	Journal of Mathematical Analysis and Applications	23,946	NSFC	76,300
17	Marine Freshwater Biology	3,16,088	Aquaculture	18,208	NSFC	12,164
18	Microbiology	13,06,765	Clinical Infectious Diseases	29,223	U.S. HHS	1,21,230
19	Engineering Electrical Electronic	15,60,722	IEEE Access	64,585	NSFC	2,07,340
20	Biophysics	5,28,262	Biophysical Journal	1,05,219	U.S. HHS	65,294

5.6 Distribution of Country Wise Collaboration of Publication of the Predefined Top Research Areas of Global Context

Table 5 shows the distribution of publication counts in terms of country wise collaboration in the top 5 research areas undertaken from the Global context. Chemistry multidisciplinary research area is top with 25,73,945 from which USA tops the publication count with 7,32,579 publication followed by Peoples R China with 5,25,025 respectively. The countries like France, England, India, South Korea, Germany and Japan have published more than 1,00,000 publications in chemistry multidisciplinary research area. it is followed by material science multidisciplinary research area with 22,75,217 publication count. It is evident from the table that Peoples R China as highest contributor in this research area with 6,12,419 publications followed by USA with 4,23,754 publications similar to the previous research area this research areas also shows that countries like France, England, India, South Korea, Germany and Japan are significantly good in terms of publishing more than 1,00,000 publications individually.

In addition the third place is occupied by the biochemistry molecular biology with 22,25,056 publications. In this research area, USA is dominating with 8,35,445 publications while Peoples R China are comparatively less with 2,13,621 publications. Unlike the first two research areas this research area has more than 1,00,000 publication count from the four countries like France, England, Germany and Japan.

The fourth research area is crystallography with 2,57,684 publication count. Peoples R China is highest with 52,843 publications followed by USA with 35,744 publications. It is understood from the publication count that crystallography has significantly less number of publication in align with the remaining four research areas publication counts. It is also surprising to note that India is in fifth place in publishing articles under crystallography research area. The fifth research area is occupied by the physics applied in the global context with the productivity of 17,38,174 publications. This area dominated by USA with 3,67,118 publications while People R China are in second place with 3,65,197

Table 5. Distribution of country wise collaboration of publication of the predefined top research areas of global context

Chemistry multidisciplinary-25,73,945			Materials science multidisciplinary - 22,75,217		Biochemistry molecular biology - 22,25,056		Crystallography-2,57,684		Physics applied - 17,38,174	
S. No.	**Country**	**Total**	**Country**	**Total**	**Country**	**Total**	**Country**	**Total**	**Country**	**Total**
1	USA	7,32,579	Peoples R China	6,12,419	USA	8,35,445	Peoples R China	52,843	USA	3,67,118
2	Peoples R China	5,25,025	USA	4,23,754	Peoples R China	2,13,621	USA	35,744	Peoples R China	3,65,197
3	Japan	1,72,746	Japan	1,83,518	Japan	1,80,256	Germany	25,307	Japan	2,07,609
4	Germany	1,61,777	Germany	1,75,727	Germany	1,59,952	Japan	24,135	Germany	1,47,918
5	South Korea	1,12,145	South Korea	1,30,536	England	1,35,975	India	17,418	South Korea	1,01,241
6	India	1,11,458	India	1,26,427	France	1,14,714	England	16,183	France	98,719
7	England	1,01,825	France	1,22,446	Canada	96,742	France	14,726	Russia	83,790
8	France	1,00,496	England	1,05,398	Italy	89,224	Russia	12,664	England	75,624
9	Spain	71,012	Italy	68,620	Spain	61,227	Poland	8,766	India	72,127
10	Italy	69,511	Russia	67,222	India	60,696	South Korea	7,696	Italy	61,834
11	Russia	68,761	Spain	62,732	South Korea	58,532	Italy	7,419	Taiwan	49,832
12	Canada	62,587	Canada	56,044	Australia	51,017	Spain	6,836	Spain	44,892
13	Poland	51,530	Australia	51,819	Netherlands	43,793	Malaysia	5,302	Canada	38,520
14	Australia	47,388	Taiwan	50,491	Russia	42,918	Australia	4,925	Poland	31,118
15	Switzerland	40,614	Poland	45,590	Sweden	41,067	Canada	4,856	Australia	30,144
16	Taiwan	38,447	Brazil	34,480	Brazil	40,301	Scotland	4,081	Switzerland	29,930
17	Iran	33,062	Iran	33,009	Switzerland	39,913	Switzerland	4,014	Netherlands	25,736
18	Brazil	32,311	Switzerland	32,716	Poland	35,726	Turkey	3,512	Singapore	24,287
19	Netherlands	32,243	Sweden	31,471	Belgium	25,728	Taiwan	3,461	Sweden	23,324
20	Sweden	26,483	Singapore	30,470	Israel	24,709	Brazil	3,306	Brazil	21,098

publications. From the table it is evident that India is in top six positions in three out of top five research areas in global research publications.

It is also shown that USA is predominant in three research areas like Chemistry Multidisciplinary, Biochemistry Molecular Biology, Physics applied while followed by Peoples R China dominant in the other research areas mainly materials science multidisciplinary and crystallography. Japan and Germany are following the same trend alternatively in the distribution of the country wise publication in the respective predefined research areas. It is also surprising to know that the majority of the Asian countries has topped in top 20 country collaboration of publications Countries like Taiwan, Iran, Brazil, Singapore, India.

5.7 Most Prolific Authors in Respective Research Areas of Highly Productive Research Domains of Bharathidasan University

Table shows the highly productive authors contribution in respective research areas with the publication counts, h-index and citations. Muthaiyah, Packianathan Thomas is leading productive author in chemistry multidisciplinary cresearch area who has h-index of 22 and publication count of 172 with 1,926 citations belonging to school of chemistry of Bharathidasan University it is followed by the author Ramamurthi K is dominant in Materials science multidisciplinary research area who has H-index of 36 and publications count of 247 with 4,259 citations. The third in place of biochemistry molecular biology is represented by Selvaraj, S for his high contribution in that research area who has h index of 18 and the publication count of 58 with the highest citation of 1,285 belonging to department of bioinformatics, school of life sciences. The author Parthasarathy, V is significantly higher contributor in crystallography research area having the H-index of 30 and publication count of 149 with 778 citations belonging to the school of physics. Similarly, the highest contributing authors from each research fields of the top 20 undertaken is been highlighted in table from which it is inferred that the author Ramamurthi K is the highest productive author in four research areas namely Materials Science Multidisciplinary, Physics Applied, Physics Condensed Matter, Engineering Electrical and

Table 6. Most prolific authors in respective research areas of highly productive research domains of Bharathidasan University

S. No.	Research areas	Authors	NP	Department	H-index	Citation
1	Chemistry Multidisciplinary	Muthiah, Packianathan thomas	172	School of Chemistry	22	1,926
2	Materials Science Multidisciplinary	Ramamurthi, K.	247	School of Physics	36	4,259
3	Biochemistry Molecular Biology	Selvaraj, S	58	Dept Bioinformatics, School of Life Science	18	1,285
4	Crystallography	Parthasarathi, V	149	School of Physics	13	778
5	Physics Applied	Ramamurthi, K.	247	School of Physics	36	4,259
6	Chemistry Physical	P, Venuvanalingam	142	School of Chemistry	29	2,471
7	Environmental Sciences	Rajaram, Rajendran	110	Department Marine Science	22	1,570
8	Physics Condensed Matter	Ramamurthi, K.	247	School of Physics	36	4,259
9	Chemistry Inorganic Nuclear	Palaniandavar, Mallayan	167	School of Chemistry	49	8,118
10	Physics Mathematical	Muthusamy, Lakshmanan	342	Centre for Nonlinear Dynamic	51	10,326
11	Biotechnology Applied Microbiology	Manickavasagam, Markandan	65	Department of Biotechnology	23	1,769
12	Physics Multidisciplinary	Muthusamy, Lakshmanan	342	Centre for Nonlinear Dynamic	51	10,326
13	Multidisciplinary Sciences	Rao, Adhikarla S.	32	Dept of Biotechnology	5	120
14	Chemistry Organic	Muthusamy, S	109	School of Chemistry	25	2,190
15	Plant Sciences	Ganapathi, Andy	95	School of Life Science, Depart of Biotech	26	2,379
16	Mathematics Applied	Ramanujam, N	35	Dept Math	15	469
17	Marine Freshwater Biology	Harikrishnan, Ramasamy	98	Dept Animal Science	32	3,325
18	Microbiology	Natarajaseenivasan, Kalimuthusamy	86	Dept Microbiology	16	946
19	Engineering Electrical Electronic	Ramamurthi, K	247	Dept Physics, Crystal Growth & Thin Film Lab	36	4,259
20	Biophysics	Samuel, Selvaraj	58	Dept Bioinformatics, School Life Science	18	1,285

Electronics having 247 publications with 4,259 citations it is followed by the author Muthusamy Lakshmanan belonging to the centre of nonlinear dynamic in university has been the highest contributor of publications in two research areas namely physics mathematical and physics multidisciplinary had 342 publications with 10,326 citations. It is also observed from the table that of the top 20 high productive authors in the top 20 research areas of Bharathidasan University 11 authors are senior faculty members and retired professors having strong base in the top 20 research areas of Bharathidasan University, it is discovered that necessary measure may be taken from young professionals to get closure to the senior professor and to dominant in terms of publication outcome.

6. CONCLUSIONS

It is concluded that the research trend of the Bharathidasan University is in line with International and national research trend. As the quit good amount of research outcome in chemistry and physics areas the third domain belong to life sciences research and of course among these micro level topics there are some areas that may not be comes in the major category of the physical sciences, chemical sciences and life sciences but in terms of medicine, engineering and social science also there but in toto the Bharathidasan University research is of versatile particularly in the scientific domains, particularly the basic sciences and also life science gaining momentum to compete with the basic science research

outcome. The University perform good in mathematics, is strong in chemical and physical sciences and also good in life sciences. The other areas also need to get improved and that also has to be undertaken by the concerned authorities and stakeholders. Though the top 20 areas for the analysis consider only to 20 funding agencies and to 20 source publications but the university research got citation of 113,276 and funded by 2,222 organisations across the globe the quantum of funding is of 2,710 out of the 6,214 total publications output of Bharathidasan University. The average citation per articles is of 18.23 the individual faculty members who have got the h index above 30 where. on par with national and international researchers. Being small university with 40 years of existence performs at higher rate of research productivity with 123 h_index as to the web of science and 133 as to the scopus.

The analysis also reveled that India is among the top ten nations in the eighteen highly productive research areas while among the top five countries in four highly productive research areas in the identified top research specialisation.

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CONTRIBUTORS

Dr S. Srinivasaragavan is presently serving as Senior Professor and Head, Department of Library and Information Science at Bharathidasan University. He has published a good number of articles in reputed national and international journals indexed in SCOPUS and UGC-CARE. He has authored four books and brought out two NAAC publications. He has been awarded and executed six R&D projects for Higher Education Department (Government of Tamil Nadu) INFLIBNET and ICSSR-IMPRESS. He has visited Research Mentor abroad for acdemic assignments on invitation. He is the coordinator for the SWAYAM programme for the University.

For this work, he undertook a comprehensive data collection process, gathering information from various sources pertinent to the research. He also created graphical representations.

Ms S. Gayathri is currently pursuing PhD (Full Time) in Department of Library and Information Science at Bharathidasan University, Tiruchirappalli, Tamil Nadu, India. In addition, she worked as research assistant in national projects like RUSA and ICSSR-IMPRESS.

For this work, she focused on developing the methodology, and designed procedures for data analysis and selected techniques to derive meaningful insights. She checked for plagiarism, and reviewed the manuscript for grammatical accuracy and clarity..