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International Journal of Current Research
Vol. 4, Issue, 12, pp. 313-317, December, 2012

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

RESEARCH ARTICLE

ALAGAPPA UNIVERSITY RESEARCH PUBLICATIONS: A SCIENTOMETRIC ANALYSIS (1999-2012)

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ARTICLE INFO

Article History:
Received 18th September, 2012
Received in revised form
25th October, 2012
Accepted 19th November, 2012
Published online 18th December, 2012

Key words:
Scientometric study,
Alagappa University,
Bibliometric study,
Citation analysis, India.

ABSTRACT

The present study was to perform a scientometric analysis of all Alagappa University research publication. A total of 922 publications were published by the Alagappa university faculty in during 1999-2012 which received 17090 citations. The average number of publications per year was 65.85. It states that globally 0.27 percents of articles were from single authors, followed by 99.73% authors by multi authors. 0.0026 percent of collaborative authors' articles published during the study periods. The highest number of publications 150 was published in 2011..The parameters studied include growth of publications and citations, relative growth rate and doubling time, national and international collaboration, highly productive institutions, highly productive authors, highly preferred journals and highly cited publications.

INTRODUCTION

The web of science database (SCI) has been recognized as the most authoritative scientometric analysis tool and as a useful supplementary tool in the evaluation of scientific research. A citation is a reference to a book, article, web page, or other published item. Raja, S.; Ramkumar, P [1] (2012) discussed the growth of Global literature in nuclear crisis deposition and make the quantitative assessment of the research in terms of year-wise research output, geographical distribution of research output, nature of collaboration, characteristics of highly productive institution and the channel of communication used by the scientists. Raja, S.; Ramkumar, P.; Viji, P.[2] (2011) Scientrometric analysis of 380 papers were published by the scientists in the field of Gender in thyroid cancer during 1991-2011.

It also analyses various other features of publications output such as modes of communication, areas of research priority, research quality, nature of collaboration, and institutional productivity and citation. Rao, I. K and Sahoo, Bibhuti Bhusan [3] (2008) has analyzed the data on distributions of multiple authors in two journals namely, JASIST and Scientometrics. Das Neves Machado, Raymundo [4] (2007) analyzed the theme "bibliometric studies" published on five Brazilian journals, from 1990 to 2005, particularly the aspects of geographic origin, chronological evolution and thematic orientation. The methodology used was the quantitative-description analysis. The citation analysis thematic, one of the styles of bibliometric studies, is what promotes Brazilian studies on this area since the beginning of the 21st century.

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Statement of the Problem

The study pointing out of analyzing the research output performance of Alagappa university research publication. In academic and scientific work, publication means of communicating research, primarily of recognition and reward and central social process in the Universities. Hence publication is a social norm in a public sense and serves as a tool for the betterment of the individuals. After the publication, it can be called as research and can be fixed or judged and acknowledged by the scientists in the society.

Scope of the Study

The study is to find out the information about the recent communication trends in the advancement of the field of Multidisciplinary subject a citation analysis "Alagappa university research publication" and for this purpose, the study is based on articles in journals, authors published the books and papers published in conference proceedings published on Alagappa university subject from 1999 to 2012 Using statistical techniques like histogram charts, bar charts etc, these will be used to interpret the data.

Limitations of the Study

- The study undertaken is limited to 14 years, i.e. 1999-2012.
- In this study we did not include the citation analysis on patents.

Data Collection

The publication of Alagappa university are mostly in the form of primary Journals, Notes, Letters, and reviews, Editorial-

materials, Meeting-abstracts, Bibliographic-items and Discussions. The research papers published by web of science in the field of Science and Technology covered and index database were taken as the prime source for the present study. Finally the cards were arranged in different ways with a view to identify the research performance of faculty Members.

RESULT AND DISCUSSION

Degree of Collaboration

The authorship pattern analyzed to determine the percentage of single and multi-authorship is denoted in table6.1. The extended of collaboration in research can be measured with the help of multi authored papers using in the formula given by subramaniyam (1982)

Degree of collaboration C= Nm/Nm+Ns

C= Degree of collaboration

Nm= Number of Multiple authors

Ns=Number of Single authors

Based on this study, the result of the degree of collaboration C = 0. 0026. i.e, 0.0026 percent of collaborative authors' articles published during the study periods. Individual contribution is just 83.54 percents in the Alagappa University research output. Multi author's contribution is 16.46 percents of the Alagappa University research output. The study interpreted that multi author contributed papers maintained the low profile among Alagappa University research scientists.

Authorship Pattern

Table 6.2 shows the number of authors and their corresponding publications. Lotka's Law, an inverse, square law, is used to find authors productivity patterns. It states that globally 83.54 percents of articles were from single authors, followed by 14.00% authors by double authors etc. The results depict that majority of papers are single authored. It clearly brings out collaborative research in the field It clearly brings out multi investigation is high compare than individual research in the institution of Alagappa university.

Relative Growth Rate and Doubling Time

Relative Growth Rate (RGR) is the increase in number of publications per unit of time. There exists a direct relation between the relative growth rate and the doubling time. The relative growth rate and doubling time of publications have been presented in Table 6.3. Figure 2 indicates the value of an average RGR of publications which decreased from 2.89 in 1999 to 0.07 in 2012. Simultaneously, the values of doubling time (Dt) of publications increased from 0.24 in 1999 to 9.62 in 2012.

Year wise distribution of documents

During 1999 - 2012 a total of 922 publications were published in Alagappa University by global. The average Number of Publications produced per year was 7.14 %. The highest number of publications 150 was produced in 2011. Table 6.7 was given year wise growth and collaboration rate in Alagappa University. It can be clearly visualized from the Table 6.7 that growth of the literature was very low during 1999. It Indicate that research in Alagappa University received a major impetus this period.

Author's wise document distribution

The most productive author is Sanjeeviraja C with 133papers dealing with Alagappa University and each 14.4% TLCS 156, TGCS 932, TLCR 115 of all papers published in this university. The authors of the seminal publication on Alagappa University given Table 6.4 Vasudevan T 123 (13.3%), TLCS 168, TGCS 682, TLCR 121 and Gopalan A 101(11.0%), TLCS 254, TGCS 1266, TLCR 193 appear on rank 2 and 3, respectively. It can be clearly visualized from the below table.

Journal wise document distribution

The most productive Journal is Bulletin of Electrochemistry and IONICS with 38 papers dealing with Alagappa University 4.1%,(TCLS 16, TGCS 79, TLCR 11 and TCLS 9, TGCS 63, TLCR 37) of all papers published in this research field. The journal of the seminal publication on Alagappa university given table 6.5, Journal of Applied Polymer Science, appear on rank 2 (4.0%), TCLS 48, TGCS 214, TLCR 86 respectively.

Word wise distribution of Documents

The high frequency keywords will enable us to understand the various aspects of Alagappa University under study. The high frequency keywords were: Films 157 (17.0%, TCLS 188, TGCS 1214), Thin 143 (15.5%, TCLS 157, TGCS 984), Characterization 128 (13.9 %, TCLS 158, TGCS 909), Synthesis 102 (11.1%, TCLS 67, TGCS 597) and Polymer 99 (6.7%, TCLS 104, TGCS 914). Analysis of the keywords appeared either on the title or assigned by the indexer or the author himself will help in knowing in which direction the knowledge grows.

Source wise distribution documents

Alagappa University Scientists communicated their research results through a variety of communication channels. Table – 6.8 provides the distribution of publications in various channels of communication. It was observed that 93.8 percent of the literature was published in Article followed by 5.0 percent in Proceedings Paper and 0.9 percent in Review and 0.3 percent in Correction.

Institution wise distribution documents

There were 293 institutions involved in research activity in the Alagappa University. Table-6.9 provides publication productivity of top 20 institutions. Alagappa university topped the list with 917 publications (99.5 %, TLCS 979, TGCS 6509) followed by Center for Electrochemical Research Institute with 133 publications (14.4 %, TLCS 125, TGCS 1017), respectively.

Country wise documents distribution

There were as many as 22 countries carrying out research in the Alagappa University. Table 6.10 provides a list of collaboration countries whose research output is less than 50

S.No	Authors	Contribution
1	Single authors	10
2	Multi authors	3732
Degree of Collaboration		0.0026

S. No	Author	Contribution	Cumulative	Percentage (%)
1	1	10	10	0.27
2	2	246	256	6.57
3	3	783	1039	20.92
4	4	820	1859	21.91
5	5	790	2649	21.11
6	6	588	3237	15.71
7	7	294	3531	7.86
8	8	136	3667	3.63
9	9	54	3721	1.44
10	10	10	3731	0.27
11	More than 10	11	3742	0.29
-	-	3742	-	100

S. No	Year	No. of Records	Cumulative	W1	W2	RGR	Doubling Time
1	1999	33	18	0.00	2.89	2.89	0.24
2	2000	35	38	2.89	3.64	0.75	0.93
3	2001	41	57	3.64	4.04	0.41	1.71
4	2002	48	77	4.04	4.34	0.30	2.30
5	2003	39	94	4.34	4.54	0.20	3.47
6	2004	58	152	1.00	5.02	4.02	0.17
7	2005	58	210	5.02	5.35	0.32	2.14
8	2006	88	298	5.35	5.70	0.35	1.98
9	2007	93	391	5.70	5.97	0.27	2.55
10	2008	62	453	5.97	6.12	0.15	4.71
11	2009	62	515	2.00	6.24	4.24	0.16
12	2010	98	613	6.24	6.42	0.17	3.98
13	2011	150	763	6.42	6.64	0.22	3.17
14	2012	57	820	6.64	6.71	0.07	9.62

publications increased from 0.24 in 1999 to 9.62 in 2012.

S. No	Publication Year	Records	Percent	TLCS	TGCS
1	1999	33	3.6	64	242
2	2000	35	3.8	94	463
3	2001	41	4.4	103	458
4	2002	48	5.2	79	610
5	2003	39	4.2	44	359
6	2004	58	6.3	103	753
7	2005	58	6.3	106	672
8	2006	88	9.5	105	1071
9	2007	93	6.1	84	910
10	2008	62	6.7	45	392
11	2009	62	6.7	66	258
12	2010	98	6.6	54	228
13	2011	150	16.3	34	105
14	2012	57	6.2	2	4

S.No	Author	Records	Percent	TLCS	TLCS/t	TLCSx	TGCS	TGCS/t	TLCR	TLCSb	TLCSe
1	Sanjeeviraja C	133	14.4	156	21.18	4	932	130.65	115	74	-
2	Vasudevan T	123	13.3	168	15.30	26	682	74.78	121	78	15
3	Gopalan A	101	11.0	254	22.72	56	1266	139.83	193	104	32
4	Mahalingam T	90	9.8	94	18.18	1	681	88.63	86	7	-
5	Jayachandran M	86	9.3	112	14.34	2	741	94.79	94	50	-
6	Manisankar P	80	8.7	122	17.48	3	569	92.73	171	39	-
7	Rajendran S	75	8.1	82	9.03	6	907	102.35	84	15	9
8	Pandian SK	54	5.9	61	19.12	9	187	49.58	62	1	-
9	Wen TC	50	5.4	140	12.33	45	779	82.01	80	42	23
10	Subramania A	48	5.2	25	3.44	3	331	59.06	37	17	-
11	Lee KP	47	5.1	51	7.12	5	700	104.71	106	31	11
12	Sankaranarayanan K	41	4.4	64	7.76	3	404	52.33	63	39	-
13	Kalaignan GP	39	4.2	27	1.93	0	196	29.42	0	11	-
14	Ramasamy P	35	3.8	43	4.57	4	384	40.39	43	20	1
15	Santhosh P	35	3.8	43	5.76	11	530	78.61	81	24	15
16	Ravi G	34	3.7	29	5.00	4	253	30.59	24	3	-
17	Thenappan T	31	3.4	62	9.26	0	146	22.15	65	22	-
18	Chandramohan R	24	2.6	5	1.08	0	121	19.74	28	0	-
19	Gopalan AI	23	2.5	26	3.48	2	303	44.59	36	15	5
20	Chu JP	22	2.4	19	4.28	0	240	30.76	15	1	3

S.NO	Journal	Recs	Percent	TLCS	TLCS/t	TGCS	TGCS/t	TLCR
1	Bulletin of Electrochemistry	38	4.1	16	1.43	79	6.81	11
2	IONICS	38	4.1	9	1.40	63	11.83	37
3	Journal of Applied Polymer Science	37	4.0	48	4.97	214	26.72	86
4	Materials Chemistry And Physics	35	3.8	44	5.02	321	39.15	47
5	Journal of Crystal Growth	31	3.4	50	4.90	512	50.19	29
6	Journal of Power Sources	20	2.2	38	4.74	363	47.52	12
7	Materials Letters	18	2.0	26	2.60	265	28.53	17
8	Electrochimica Acta	17	1.8	45	5.06	236	30.01	33
9	Journal of Materials Science-Materials in Electronics	15	1.6	18	4.25	59	12.66	13
10	Materials Research Bulletin	15	1.6	14	1.97	94	12.51	12
11	Crystal Research and Technology	13	1.4	20	2.53	127	16.66	8
12	Journal of New Materials for Electrochemical Systems	13	1.4	13	2.10	26	4.09	21
13	Journal of Materials Science	11	1.2	14	1.67	36	5.17	11
14	Spectrochimica Acta Part A-Molecular and Biomolecular Spectroscopy	11	1.2	13	1.47	47	8.64	25
15	Chalcogenide Letters	10	1.1	2	0.50	7	2.00	3
16	Journal of Alloys and Compounds	10	1.1	1	0.50	32	7.34	9
17	Journal of Molecular Liquids	10	1.1	31	4.76	87	13.61	12
18	Materials Science and Engineering B-Solid State Materials for Advanced Technology	10	1.1	7	0.58	71	8.68	9
19	Thin Solid Films	10	1.1	12	1.72	82	9.78	7
20	Physica B-Condensed Matter	9	1.0	5	0.91	66	13.33	6

S. No	Word	Records	Percent	TLCS	TGCS
1	Films	157	17.0	188	1214
2	Thin	143	15.5	157	984
3	Characterization	128	13.9	158	909
4	Synthesis	102	11.1	67	597
5	Polymer	99	6.7	104	914
6	Properties	96	6.4	60	614
7	Electrochemical	87	9.4	130	906
8	Poly	86	9.3	151	886
9	Based	75	8.1	47	526
10	Growth	68	7.4	81	548
11	Effect	66	7.2	72	443
12	Electrolytes	66	7.2	80	730
13	Novel	54	5.9	103	641
14	Lithium	50	5.4	34	426
15	Acid	48	5.2	65	569
16	Ion	48	5.2	27	425
17	Oxide	48	5.2	35	363
18	Using	46	5.0	39	286
19	Optical	45	4.9	30	225
20	Structural	41	4.4	21	236

S.No	Document Type	Records	Percent	TLCS	TGCS
1	Article	865	93.8	949	6096
2	Proceedings Paper	46	5.0	29	356
3	Review	8	0.9	5	73
4	Correction	3	0.3	0	0

S. No	Institution	Records	Percent	TLCS	TGCS
1	Alagappa University	917	99.5	979	6509
2	Cent Electrochemical Research Institute	133	14.4	125	1017
3	National Cheng Kung University	51	5.5	140	807
4	Kyungpook National University	49	5.3	48	677
5	Anna University	48	5.2	51	438
6	Madurai Kamaraj University	37	4.0	36	158
7	Ajou University	21	2.3	52	133
8	National Taiwan Ocean University	21	2.3	10	236
9	Sree Sevugan Annamalai College	20	2.2	2	65
10	Periyar University	17	1.8	39	151
11	Dongguk University	13	1.4	6	11
12	Indira Gandhi Center Atom Research	13	1.4	7	45
13	Kalasalingam University	13	1.4	2	30
14	Scott Christian College Autonomous	13	1.4	10	28
15	Thiagarajar College of Engineering	13	1.4	7	40
16	University of Madras	13	1.4	5	25
17	Nano Practical Application Center	12	1.3	16	264
18	Saraswathi Narayanan College	12	1.3	21	205
19	University Nacl Autonoma Mexico	12	1.3	22	215
20	AVVM Sri Pushpam College	11	1.2	4	27

S.No	Country	Records	Percent	TLCS	TGCS
1	India	922	100.0	983	6525
2	South Korea	106	11.5	116	1148
3	Taiwan	90	9.8	166	1202
4	Mexico	28	3.0	34	253
5	Japan	20	2.2	1	33
6	USA	14	1.5	26	102
7	Singapore	13	1.4	8	23
8	Germany	11	1.2	6	33
9	U Arab Emirates	5	0.5	0	35
10	UK	5	0.5	1	18
11	Peoples R China	4	0.4	1	79
12	Israel	3	0.3	1	17
13	South Africa	2	0.2	1	2
14	Spain	2	0.2	1	2
15	Bangladesh	1	0.1	0	1
16	Canada	1	0.1	0	0
17	Eritrea	1	0.1	0	0
18	Ethiopia	1	0.1	0	0
19	France	1	0.1	0	0
20	Oman	1	0.1	0	6
21	Poland	1	0.1	0	39
22	Romania	1	0.1	0	0

S.No	Author / Year / Journal	Records	Percent
1	Armand M.B., 1979, Fast Ion Transport in Solids. Electrodes and Electrolytes	36	3.9
2	Tamman V.G., 1926, ANORG ALLG CHEM, V19, P245	31	3.4
3	Vogel H, 1921, PHYS Z, V22, P645	28	3.0
4	Fulcher GS, 1925, J AM CERAM SOC, V8, P339, DOI 6.1111/j.1151-2916.1925.tb16731.x	27	2.9
5	Rajendran V, 2000, J ELECTROCHEM SOC, V147, P3014, DOI 6.1149/1.1393641	25	2.7
6	Rhoo HJ, 1997, ELECTROCHIM ACTA, V42, P1571, DOI 6.1016/S0013-4686(96)00318-0	25	2.7
7	SHIM YB, 1990, J ELECTROCHEM SOC, V137, P538, DOI 6.1149/1.2086494	23	2.5
8	APPETECCHI GB, 1995, ELECTROCHIM ACTA, V40, P991, DOI 6.1016/0013-4686(94)00345-2	21	2.3
9	ALAMGIR M, 1993, J ELECTROCHEM SOC, V140, pL96, DOI 6.1149/1.2221654	20	2.2
10	TSUCHIDA E, 1983, ELECTROCHIM ACTA, V28, P591, DOI 6.1016/0013-4686(83)85049-X	20	2.2
11	BOHNKE O, 1993, SOLID STATE IONICS, V66, P97, DOI 6.1016/0167-2738(93)90032-X	18	2.0
12	WILLIAMSON GK, 1956, PHILOS MAG, V1, P34, DOI 6.1080/14786435608238074	18	2.0
13	OKAMOTO Y, 1993, J POLYM SCI POL CHEM, V31, P2573, DOI 6.1002/pola.1993.080311018	17	1.8
14	Jacob MME, 1997, SOLID STATE IONICS, V104, P267, DOI 6.1016/S0167-2738(97)00422-0	16	1.7
15	SWANEPOEL R, 1983, J PHYS E SCI INSTRUM, V16, P1214, DOI 6.1088/0022-3735/16/12/023	16	1.7
16	WEI Y, 1989, J PHYS CHEM-US, V93, P495, DOI 6.1021/j100338a095	16	1.7
17	WEI Y, 1990, MACROMOLECULES, V23, P758, DOI 6.1021/ma00205a011	16	1.7
18	WILLIAMS ML, 1955, J AM CHEM SOC, V77, P3701, DOI 6.1021/ja01619a008	16	1.7
19	ABRAHAM KM, 1990, J ELECTROCHEM SOC, V137, P1657, DOI 6.1149/1.2086749	15	1.6
20	CROCE F, 1994, ELECTROCHIM ACTA, V39, P2187	14	1.5

publications. India is top producing country with 922 publications (100.0%, TLCS 983, TGCS 6525) followed by South Korea with 106 publications (11.5%, TLCS 116 TGCS 1148), Taiwan with 90 Publications (9.8%,TLCS 166, TGCS 1202), respectively.

Cited reference wise documents distribution

The most cited reference is Armand M.B., 1979, Fast Ion Transport in Solids. Electrodes and Electrolytes with 36 papers dealing with Alagappa University 3.9 % of all papers published in this University. The cited reference of the seminal publication on Alagappa university given Table 6.11, appear on rank 2 & 3 Tamman V.G., 1926, ANORG ALLG CHEM, V19, P245 and Vogel H, 1921, PHYS Z, V22, P645 respectively. It can be clearly visualized from the below table

Conclusion

The Growth rate of Alagappa university published literature is determined by calculating relative growth rates is declining trend. RGR of publications which decreased from 2.89 in 1999 to 0.07 in 2012(only 2004 and 2009 varied). Simultaneously, the values of doubling time (Dt) of publications increased from 0.24 in 1999 to 9.62 in 2012. The most productive journal is "Bulletin of Electrochemistry". In Global level the above study shows the result of the degree of collaboration C = 0.0026. i.e, 0026 percent of collaborative authors' articles published during the study periods. The most productive author is "Sanjeeviraja C". The highest literature growth occurs in 2011 and highest total global citation score in 2006.

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