

# Analysis of the Publications of the KSR College of Engineering: A Bibliometric Study

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## Abstract

*The study examined the analysis of research publications of the faculty of KSR College of Engineering, Tiruchengode, Tamil Nadu, India. Data has been downloaded during the selected ten years between 2007 and 2016 from the Scopus database. Among the 465 papers published in the span of 10 years, highest numbers of 101 papers were published in the year 2015. The total numbers of citation received by the papers were 1149 and the citing articles were 252. The h-index of KSR College of Engineering, Tiruchengode, India was 15.*

**Keywords:** *Research publications, research output, KSR College of Engineering, Scopus, scientometrics*

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## INTRODUCTION

The quality of research output is totally dependent on the information used and produced as a result of research. Scientific output in the form of publications can be measured by using bibliometric/scientometric techniques such as number of publications based on author, institution, country, year, type, subject and citation etc. In this study, the researcher has made an attempt to study the research publications productivity of the faculty of KSR College of Engineering, Tiruchengode, India, by using scientometric techniques.

## REVIEW OF LITERATURE

Sudhier and Priyalakshmi [1] have studied the research publication trend among the scientists of Central Tuber Crops Research Institute (CTCRI), Thiruvananthapuram, India and found that 87% of the research publications among the 1076 papers were multiauthored and most of them were published in foreign journals.

Aswathy and Kopikuttan [2] analyzed the publication pattern of three Universities in Kerala viz., University of Kerala, Calicut University and Mahatma Gandhi University and found that there was no significant difference in experience and productivity but the increase in age and experience has resulted in more collaborative papers.

Mandhirasalam [3] analyzed the publication output of Coimbatore College of Technology (CIT), Coimbatore, India and reported significant contribution (86.38%) in the total publication output 639 (papers) exits from the year 2006 onwards.

Mandhirasalam [4] analyzed the publication output of Thiagarajar College of Engineering (TCE), Madurai, India and reported significant contribution (82.23%) in the total publication output 1497 (papers) exits from the year 2008 onwards.

Bathrinarayanan and Tamizhcelvan [5] have studied the research output in MEMS contributed by the global research output during the period of 2010–2014. A total of 22303 publications were downloaded and the scientometric tools such as relative growth rate and doubling time were analyzed.

Mandhirasalam [6] analyzed the publication output of PSG College of Technology (PSGCT), Coimbatore, India and reported that 2357 papers were published in the span of 44 years, i.e., from 1971 to 2014 and 2112 papers (89.6%) were published during the last ten years.

Sivakumar [7] analyzed the publication output of PSG College of Arts & Science (PSGCAS),

Coimbatore, India and reported that 430 papers were published in the span of 15 years, i.e., from 2001 to 2015. The finding of overall growth rate of publications has shown increasing trend during the study period. There was highest publication in the year 2015. Consequently the doubling time for publications has shown an increasing trend. From the analysis multiauthored contribution occupied extreme position and also degree of collaboration of authorship pattern indicates the trend towards collaborative as well interdisciplinary research.

## OBJECTIVES

The objectives of the study include:

- To find out the year-wise research productivity of KSRCE, Tiruchengode, India during 2007–2016.
- To know the forms of publications output of KSRCE, Tiruchengode, India.
- To determine the most productive authors and authorship pattern.
- To identify the research collaboration of KSRCE, Tiruchengode, India with other countries and institutions.
- To examine the subject areas of publications.

## METHODOLOGY

Data about the research publication of the faculty of KSRCE, Tiruchengode, India were downloaded during the selected ten years between 2007 and 2016 from Scopus database. Scopus, a product of Elsevier, is the largest abstract and citation database of peer-reviewed literature—scientific journals, books and conference proceedings. It gives a comprehensive overview of the world's research output in the fields of science, technology, medicine, social science and arts and humanities. It offers the number of citations received by each published document. It has a facility to calculate h-index of authors and institutions. The keywords 'KSR College of Engineering' was used in the search option selecting the affiliation category.

## ANALYSIS AND INTERPRETATION

Table 1 describes the year-wise distribution of number of publication indexed in Scopus database from 2007 to 2016.

**Table 1: Year-wise Output of Publication.**

Year	Records	Percent	No. of articles cited	Total citation score
2007	1	0.21	1	3
2008	4	0.86	2	14
2009	11	2.37	9	26
2010	26	5.60	17	229
2011	48	10.32	32	136
2012	63	13.54	45	301
2013	75	16.13	46	166
2014	95	20.43	53	160
2015	101	21.72	38	90
2016	41	8.82	9	24
<b>Total</b>	<b>465</b>	<b>100.00</b>	<b>252</b>	<b>1149</b>

It could be noted from Table 1 that there was a gradual increase in the number of publications started from 2009 with 11 publications and 2015 was the most productive year with 101 publications followed by 2014 with 95 publications. Further it was found that the research output during the last five years contributes 375 (80.6%) publications among the total 465 publications in the last 10 years. But in the year 2016 publication has reduced with only 41 publications.

## Relative Growth Rate (RGR) and Doubling Time of Publications

Table 2 discusses the relative growth rate of the publications during the year 2001–2015. The relative growth rate (RGR) has decreased in the number of publications/pages per unit of time. The RGR and doubling time model was developed by Mahapatra [8]. The doubling time for article output has increased from 0.43 in 2007 to 7.70 in 2015. It could be deduced from the above discussion that the RGR was decreased from 1.61 to 0.09 during the study period.

## Ranking of Authors Based on Publications

Table 3 describes the ranking of authors based on publications.

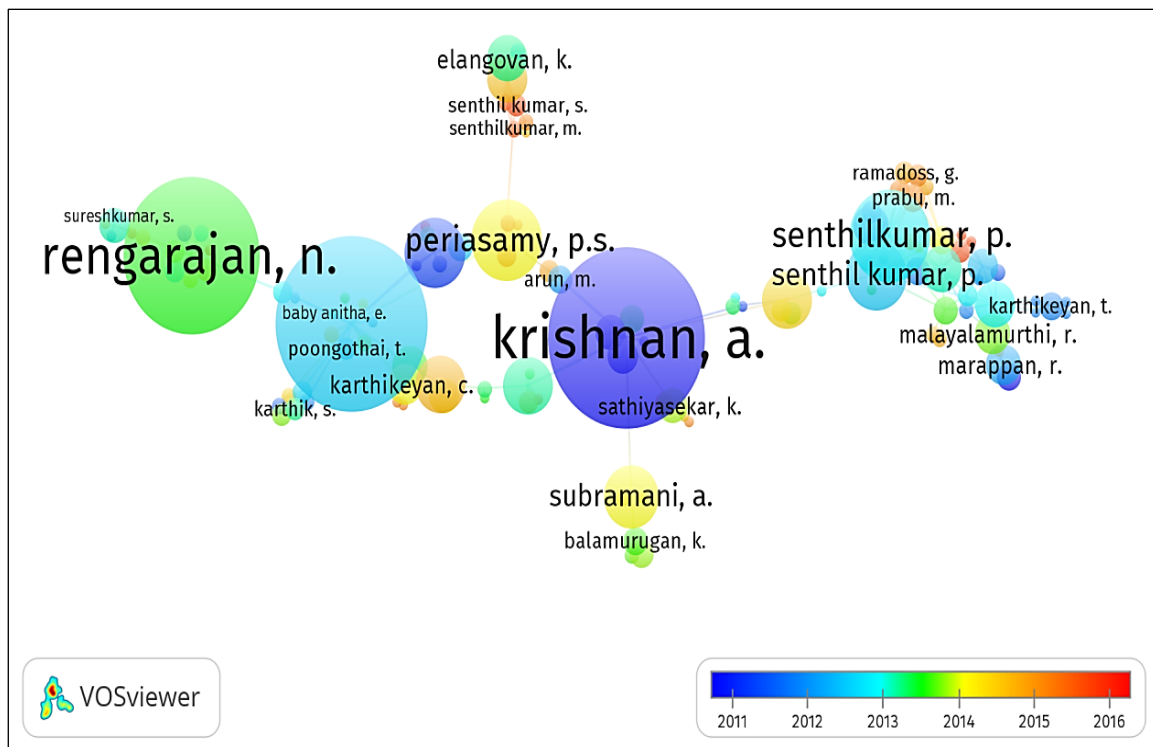
Table 3 and Figure 1 shows that Krishnan A is the most productive author with 30 (6.45%) publications followed by Duraisamy K with 29 (6.24%) publications, Rengarajan N with 28 (6.02%) publications and Senthilkumar P with 22 (4.73%) publications. The remaining authors contributed more or less equal number of publications in their respective field.

**Table 2: Relative Growth Rate (RGR) and Doubling Time of Publications.**

S.No	Year	No. of records	%	Cumulative	W1	W2	RGR	DT
1	2007	1	8.82	1	--	0	0	
2	2008	4	21.72	5	0	1.61	1.61	0.43
3	2009	11	20.43	16	1.61	2.77	1.16	0.60
4	2010	26	16.13	42	2.77	3.74	0.97	0.71
5	2011	48	13.54	90	3.74	4.50	0.76	0.91
6	2012	63	10.32	153	4.50	5.03	0.53	1.31
7	2013	75	5.60	228	5.03	5.43	0.40	1.73
8	2014	95	2.37	323	5.43	5.78	0.35	1.98
9	2015	101	0.86	424	5.78	6.05	0.27	2.57
10	2016	41	0.21	465	6.05	6.14	0.09	7.70
<b>Total</b>		<b>465</b>	<b>100.00</b>	<b>1747</b>				

**Table 3: Ranking of Authors Based on Publications.**

S.No	Author	Records	Percent	No. of articles cited	Total citation score
1	Krishnan A	30	6.45	24	104
2	Duraisamy K Krishnan, A.	29	6.24	15	51
3	Rengarajan N	28	6.02	14	73
4	Senthilkumar P	22	4.73	11	180
5	Palanisamy T	13	2.79	5	7
6	Thangavel S	13	2.79	7	56
7	Chandrasekar C.	12	2.58	9	38
8	Subramani A	12	2.58	11	65
9	Ganesan S	11	2.37	8	25
10	Kannan R.	11	2.37	8	25



**Fig. 1: Mapping and Clustering of Authors Productivity.**

### Authorship Pattern

Table 4 revealed that a total of 2032 authors have contributed 465 articles and the average number of authors per article was observed to be 4.4. Among 430 articles only five articles (1.1%) were written by a single author and 460 (98.9%) articles were written by multiple authors. Two and three author's articles involved highest percentage 394 (84.7%) and the rest of the articles were contributed by more than three authors.

### Degree of Collaboration of Publications

Collaborations is a joint effort among two or more researchers both physically and intellectually to work together in a research. Degree of collaboration varies from one subject to another. Extend of collaboration can be measured with the help of multiauthored papers. Collaborative coefficient is used to measure the collaborative research publications. Collaborative coefficient is a ratio of the number of collaborative research publications during a particular period of time. According to the formula of Subramanyam to determine the degree of collaboration in a discipline, the value of collaboration will be between 0 and 1. To examine the degree of collaboration of publications, the number of single authored and multiauthored publications was calculated using the Subramanyam formula [9]:

$$C = \frac{Nm}{Nm + Ns}$$

Where, C = Degree of collaboration

Nm = Number of multiauthored publications

Ns = Number of single authored publications  
460

Hence C =  $\frac{460}{460+5}$

Hence, it was found that the degree of collaboration of publications of KSR College of Engineering faculty, Tiruchengode, India was 0.99.

### Type of Publication

The productivity of the author based on the type of publications is depicted in Table 5.

It is found from Table 5 that the faculties of KSR College of Engineering, Tiruchengode, India published their research findings in the form of articles 368 (79.14%) in journals as the medium for publications. They have also presented their papers in the conferences and

found 84 papers (18.06%) in the proceedings. Remaining forms such as review, book chapter etc. was contributed very less 13 with (2.8%) in the total publications.

### Country-wise Collaborations

The productivity of the author publications based on the country-wise collaborations is depicted in Table 6.

Table 6 shows that faculty of KSR College of Engineering, Tiruchengode, India has collaborated with Italy and United States and published five (4.9%) publications each. KSR College of Engineering, Tiruchengode, India, also collaborated and contributed with Canada, Malaysia, Slovia and South Korea and published one paper each with these countries.

### Ranking of Collaborative Institutions

The productivity of the author publications based on the collaborative Institutions is depicted Table 7.

It was found from the Table 7 that researchers from 160 institutions have collaborated with faculty of KSR College of Engineering, Tiruchengode, India. Among them K S Rangasamy College of Technology, stand first with 66 (14.19%) publications, followed by Anna University with 23 (4.95%) publications.

**Table 4: Authorship Pattern.**

S.No	No. of authors	No. of publications	%	Authorship pattern	%
1	Single	5	1.1	5	0.2
2	Two	265	56.9	270	13.3
3	Three	129	27.8	399	19.6
4	Four	39	8.4	438	21.6
5	Five	17	3.7	455	22.4
6	More than Five +	10	2.1	465	22.9
<b>Total</b>		<b>465</b>	<b>100</b>	<b>2032</b>	<b>100</b>

**Table 5: Type of Publication.**

Publication Type	Records	Percent	No. of articles cited	Total citation score
Article	368	79.14	194	842
Conference Paper	84	18.06	52	167
Review	5	1.08	3	128
Article in Press	4	0.86	-	-
Book Chapter	3	0.65	1	2
Letter	1	0.21	-	-
<b>Total</b>	<b>465</b>	<b>100.0</b>		<b>1139</b>

### Ranking of Subject-wise Distribution

Table 8 shows the subject-wise distribution. A total of 250 articles (53.77%) were published by the author of KSRCE on Engineering followed by Computer Science with 162 articles (34.84%), Material Science with 78 articles (16.77%), and Mathematics with 63 articles (13.55%). The next position was taken by Earth and Planetary Sciences with 50 articles (10.75%), Chemistry with 44 articles (9.46%), Physics and Astronomy with 37 articles (7.96%), Energy with 34 articles (7.31%), Multidisciplinary with 31 articles (6.67%), and Environmental Sciences with 29 articles (6.24%). Authors have contributed more papers on Engineering and Computer Science.

Table 9 revealed that International Journal of Applied Engineering Research published 39 (8.39%) papers among 124 journals, European Journal of Scientific Research published 23 (4.95%) papers, Journal of Computer Science published 13 (2.80%) papers, Journal of Scientific and Industrial Research published 12 (2.58) papers, and Asian Journal of Information Technology published 11 (2.37) papers.

Table 10 revealed that out of 465 papers, 213 papers were not cited. About 229 papers were cited less than 1–10 times. Only one paper was cited more than 100 times and seven papers were cited 11–30 times, respectively. It can be concluded from Table 10 that only eight papers were high quality when compared to other papers.

**Table 6: Country-wise Collaborations.**

Country	Records	Percent	No. of articles cited	Total citation score
India	449	96.6	239	1088
Italy	5	1.07	5	42
United States	5	1.07	2	2
Canada	1	0.21	2	5
Malaysia	1	0.21	1	1
Slovakia	1	0.21	1	5
South Korea	1	0.21	1	1
Undefined	2	0.42	1	5
<b>Total</b>	<b>465</b>	<b>100.0</b>	<b>252</b>	<b>1149</b>

**Table 7: Ranking of Collaborative Institutions.**

Rank	Institution	Recd	%	No. of articles cited	Total citation score
1	K S Rangasamy College of Technology	66	14.19	36	172
2	Anna University	23	4.95	17	56
3	Periyar University	18	3.87	14	51
4	Institute of Road and Transport Technology	16	3.44	09	40
5	Government College of Technology Coimbatore	14	3.01	09	26
6	Bannari Amman Institute of Technology	13	2.79	09	15
7	Satyabama University	11	2.37	04	12
8	PSG College of Technology	11	2.58	05	116
9	Annamalai University	11	2.58	05	05
10	Sathyabama University	11	2.58	05	05
11	Government College of Engineering, Salem	10	2.15	05	05

**Table 8: Ranking of Subject-wise Distribution.**

Rank	Subject	Recd	%	No. of articles cited	Total citation score
1	Engineering	250	53.77	120	588
2	Computer Science	162	34.84	98	358
3	Materials Science	78	16.77	43	240
4	Mathematics	63	13.55	31	119
5	Earth and Planetary Sciences	50	10.75	16	74
6	Chemistry	44	9.46	25	130
7	Physics and Astronomy	37	7.96	17	59
8	Energy	34	7.31	25	280
9	Multidisciplinary	31	6.67	21	113
10	Environmental Science	29	6.24	11	52



It is clear from Table 11 that paper entitled 'Active solar distillation—A detailed review activated' published by Kumar *et al.*, in the Renewable and Sustainable Energy Reviews in 2010, is the most cited paper of KSR College of Engineering, Tiruchengode, India and has

received 109 citations. Paper entitled 'Investigation of physical, chemical and mechanical properties of raw and alkali treated Borassus fruit fiber' has come second with 40 citations.

**Table 9: Ranking of Journals Based on Publications.**

Rank	Journal	Recd	%	No. of articles cited	Total citation score
1	International Journal of Applied Engineering Research	39	8.39	6	6
2	European Journal of Scientific Research	23	4.95	11	66
3	Journal of Computer Science	13	2.80	11	31
4	Journal of Scientific and Industrial Research	12	2.58	6	43
5	Asian Journal of Information Technology	11	2.37	2	04
6	Australian Journal of Electrical and Electronics Engineering	9	1.94	4	16
7	International Journal of Chemtech Research	9	1.94	6	16
8	International Journal of Earth Sciences and Engineering	8	1.72	2	2
9	Journal of Theoretical and Applied Information Technology	8	1.72	4	5
10	Communications in Computer and Information Science	7	1.51	3	4

**Table 10: Citation Statistics.**

No. of citations received by papers	No. of papers	Percentage (%)
Uncited papers	213	45.80
Less than 1–10	229	49.3
11–20	15	3.23
21–30	4	0.86
31–40	3	0.65
More than 100	1	0.22

**Table 11: Ranking of Papers Based on Global Citation Score (GCS).**

Rank	Paper; Author; Journal	GCS
1	Active solar distillation—A detailed review; Sampathkumar K, Arjunan TV, Pitchandi P, Senthilkumar P; Renewable and Sustainable Energy Reviews, Vol 14. I. No.6, Page No.1503–1526.	109
2	Investigation of physical, chemical and mechanical properties of raw and alkali treated Borassus fruit fiber; Boopathi L, Sampath PS, Mylsamy K; Composites Part B: Engineering, Vol 43, I.No.8, Page No. 3044–3052.	40
3	Study of performance and emission characteristics of a diesel engine using thevetia peruviana biodiesel with diethyl ether blends; Kannan TK, Marappan R; European Journal of Scientific Research, Vol 43, I.No.4, Page No.563–570.	35
4	Utilization of solar water heater in a single basin solar still-An experimental study; Sampathkumar K, Senthilkumar P; Desalination, Vol.No.297, Page No.8–19.	33
5	Optimization of operation sequencing in CAPP using simulated annealing technique (SAT); Nallakumarasamy G, Srinivasan PSS, Venkatesh Raja K, Malayalamurthi R; International Journal of Advanced Manufacturing Technology, Vol.No. 54, Page No.721–728.	27
6	Photovoltaic based dynamic voltage restorer with power saver capability using PI controller; Ramasamy M, Thangavel S; International Journal of Electrical Power and Energy Systems, Vol No.36, I.No.1 Page No. 51–59.	26
7	Photovoltaic based distribution static compensator for power quality improvement; Kamatchi Kannan V, Rengarajan N; International Journal of Electrical Power & Energy Systems, Vol No. 42, I.No.1, Page.No. 685–692.	25
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9	Experimental verification of pv based dynamic voltage restorer (PV-DVR) with significant energy conservation; Ramasamy M, Thangavel S; International Journal of Electrical Power and Energy Systems, Vol No. 49, I.No.1, Page No. 296–307.	18
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## CONCLUSIONS

From the observations made in this study, it can be concluded that KSR College of Engineering, Tiruchengode, India has published 465 articles during the period of study. The finding of overall growth rate of publications has shown increasing trend during the study period. There is highest publication in the year 2015. Consequently the doubling time for publications has shown an increasing trend. The present study showed that highest number of articles has appeared in the area of Engineering followed by Computer Science. From the analysis, multiauthored contribution occupied extreme position. Single authored contribution is very less. Degree of collaboration of authorship pattern indicated the trend towards collaborative as well interdisciplinary research. Since the collaboration with other countries was not much the faculty members may have collaboration with different countries to make the research work more qualitative one.

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