

Scientometric Analysis of Research Publications of Indian Institute of Technology kharagpur: A study based on Indian Citation Index (2004 -2016)

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Abstract: *The Scientometric study of the research publications of the faculty members and researchers of Indian Institute of Technology, kharagpur for the period January 2004-December 2016 is carried out using Indian Citation Index (ICI) database. The study aims to analyze the research growth in different domain in Indian Institute of Technology, kharagpur. It covers total of 1477 articles retrieved from ICI database for the period of 13 years. In this study an attempt is made to analyze the year wise growth of research publications of Indian Institute of Technology, kharagpure on articles, author productivity Citation articles, Subject categories and document type.*

Key Words: *Scientometric, Citation Index, IIT kharagpur, Indian Citation Index.*

1. INTRODUCTION:

Scientometric is the study of measuring and analyzing science, technology and innovation. It is used to understand the evolution of literature, identification of core journal in specific fields and trends of literature in particular fields or within a geographical area. Indian Citation Index is one of the simple tools to measuring the quantity and quality of publications published journals either printed or online. It covers 961 publications and index 5, 68,044 articles covered. This study is an attempt to show the quality and quantity of research articles from the Indian Institute of Technology, (IIT) kharagpure. The Institute was also given the status of an autonomous University. From this modest start in 1950, IIT Kharagpur has been engaged in a steady process of development with about 18 academic departments, five centers of excellence. The vast tree-laden campus, spreading over 2100 acres has a self contained township of over 15,000 inhabitants. Currently we have about 550 faculty, 1700 employees and 9000 students on the campus to a limited time span i.e., 2004-2016 based on ICI Data base. Indian Citation Index (ICI) is a fully web based abstract and citation database covering Research & Development literature across all disciplines, published in journals or in other documents published in India. It is an effective, authenticate and rigours evaluation tool for Indian scholarly publications. It is developed by "The Knowledge Foundation" with the required support of M/s Diva Enterprises Pvt. Ltd. Though, at international level few tools/databases are available but the coverage of Indian contents particularly published in the local and national journals are much negligible. The ICI database enables access and empowers users to search, track, measure and collaborate in the sciences, social sciences, arts, and humanities to turns raw data/information into the powerful knowledge. ICI like other indexes enables user to move back in time to previously published papers, but uniquely one can also look forward in time to determine who has subsequently cited an earlier piece of research. This feature makes this database a specialized information product and highly useful for researchers, policy makers, decision takers, editors, librarians etc.

2. OBJECTIVES:

The objectives of the present study are.

1. To know the year wise growth of the research publications of Indian Institute of Technology, kharagpur.
2. To know the author wise productivity of research publications of Indian Institute of Technology, kharagpur.
3. To Identify the Subject wise distribution of research publications.
4. To identify the most cited and citation density of publications of Indian Institute of Technology, kharagpur.
5. To know the top fifteen journals preferred by the researchers for publications.
6. To identify the most preferred type of communication by the researchers.

3. METHODOLOGY OF THE STUDY:

The data for the study for the period January 2004 – December 2016 are retrieved from the Indian Citation Index database using Institute Analyzer. Among the top 50 Institutes, the Indian Institute of Technology, kharagpur with the number of 1477 research publications retrieved for the time span of thirteen years. All the retrieved publications were analyzed using deferent area like Citation, Cited articles, Author, Subject Categories, Document type, publication type etc through ICI database.

4. DATA ANALYSIS AND INTERPRETATION:

4.1. Growth of Publications:

The number of research publications published year wise from the Indian Institute of Technology kharagpur, the percentage and growth for the period January 2004 to December 2016 indexed in Indian Citation Index database are show in Table 1and Figure 1. A total number of 1477 articles were published during the period. In the year 2007, 163 articles were published which is the highest and constitute 11.03% of the total documents indexed for the period.

Table: 1 Year wise growth of publications

Sl. No.	Publication Year	Number of articles	% of 1477
1	2004	128	8.66%
2	2005	133	9.00%
3	2006	125	8.46%
4	2007	163	11.03%
5	2008	118	7.99%
6	2009	116	7.85%
7	2010	121	8.19%
8	2011	102	6.90%
9	2012	111	7.51%
10	2013	92	6.23%
11	2014	99	6.70%
12	2015	100	6.77%
13	2016	69	4.67%

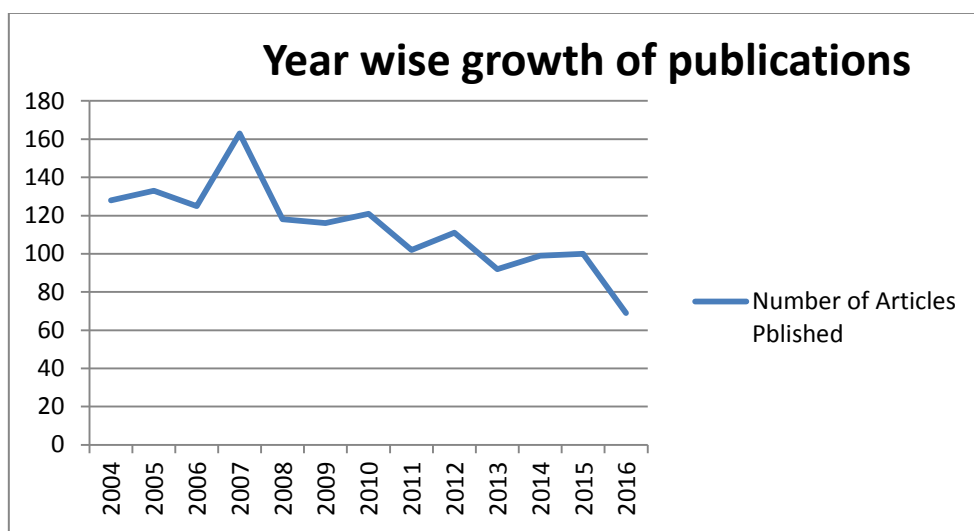


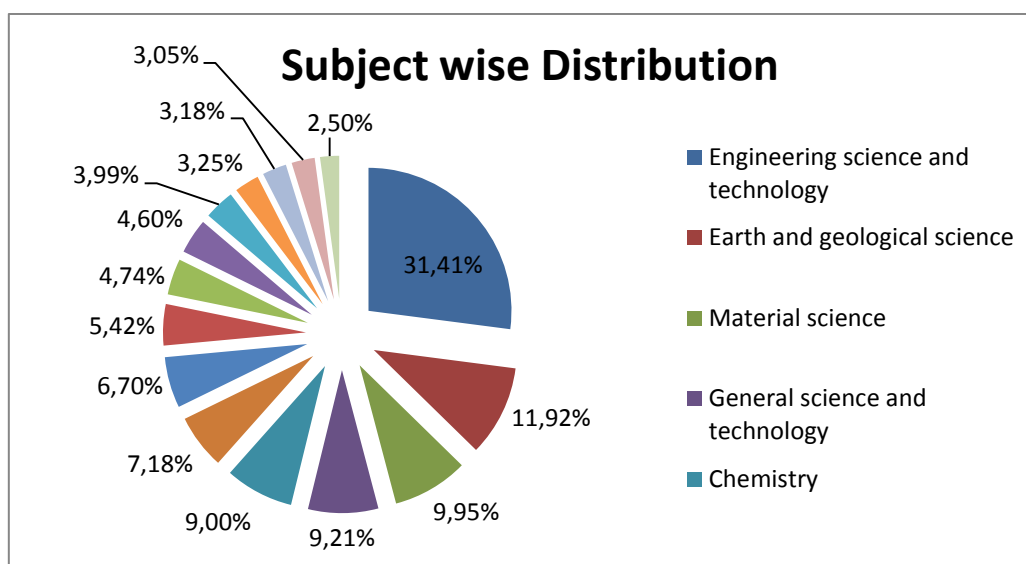
Figure 1

4.2. Subject wise distribution of Publications:

The subject wise distribution of research publications of Indian Institute of Technology kharagpur for the period 2004 to December 2016 is shown in the table 2 and Figure 2. In this period there are 47 subjects are covered in ICI database. The top 15 highly contributed subjects among 47 subjects are given in the table. Among the top 15 subjects, the Engineering science and technology has contributed highest number 464(31.41%) out of 1477.

Table: 2 Subject wise distribution

Sl.No.	Subject Category	Number of articles	% of 1477
1	Engineering science and technology	464	31.41%
2	Earth and geological science	176	11.92%
3	Material science	147	9.95%
4	General science and technology	136	9.21%
5	Chemistry	133	9.00%
6	Agriculture	106	7.18%
7	Environmental science	99	6.70%
8	Physics	80	5.42%
9	Food and beverage science	70	4.74%
10	Biological science	68	4.60%
11	Social science	59	3.99%
12	Health science	48	3.25%
13	Management	47	3.18%
14	Energy and fuel science	45	3.05%
15	Statistics	37	2.50%

**Figure 2**

4.3. Author wise contribution of Research Publications:

The author wise contribution of research publications of Indian Institute of Technology kharagpur for the period 2004 to December 2016 is show in the Table 3. The top 15 among the total number of 2745 authors from Indian Institute of Technology kharagpur, the First place is occupied by Suar Damodar with 30 (2.03%) publications and Pradhan S C in 2nd place with 20 (1.35%) publications and Gupta Anil K in third place with 19 (1.29%) publications.

Table 3: Top 10 Author Wise Contribution

Sl.No.	Authors	Number of articles	% of 1477
1	Suar Damodar	30	2.03%
2	Pradhan S C	20	1.35%
3	Gupta Anil K	19	1.29%
4	Mitra Analava	18	1.22%
5	Das S K	14	0.95%
6	Mitra A	14	0.95%
7	Goswami T K	14	0.95%
8	Chakraborty M	13	0.88%
9	Mamtani Manish A	12	0.81%
10	Ghosh S K	12	0.81%
11	Adhikari Basudam	12	0.81%

12	Bhattacharya D	12	0.81%
13	Choudhary RNP	11	0.74%
14	Behera M D	11	0.74%
15	Tiwari K N	11	0.74%

4.4. Most preferred document category:

The most preferred type of document category by the researcher of Indian Institute of Technology kharagpur for their research publication is shown in the table4. Out of 1477 research publications retrieved from the ICI, research articles received maximum number i.e. 1289(87.27%) and the remaining types of documents are less preferred.

Table: 4 most preferred document category

Sl.No.	Document Categories	Number Of Records	% of 1477
1	Research article	1289	87.27%
2	Review article	57	3.86%
3	Short communication	46	3.11%
4	Research note	26	1.76%
5	Editorial	20	1.35%
6	Case study	17	1.15%
7	Proceedings paper	8	0.54%
8	Special article	6	0.41%
9	Report (R&D)	5	0.34%
10	Research method	1	0.07%
11	Unknown	2	0.13%

4.5. Rank list of Journals:

The table 5 shows top ten Journals preferred by the researchers of Indian Institute of Technology kharagpur for the publications of their research findings as per the data retrieved from Indian Citation Index database. Out of 1477 retrieved publications, the first place is occupied by the 'Current Science' with 75 (5.08%) articles. This is followed by Journal of Chemical Science' and Indian Foundry Science have Fourteen and fifteen place respectively.

Table 5: Rank list of top 15 Journals

Sl.No.	Journals Name	Number of Articles	% of 1477
1	Current science	75	5.08%
2	Journal of food science and technology	44	2.98%
3	Journal of mines metals & fuels	42	2.84%
4	Bulletin of materials science	39	2.64%
5	Journal of geological society of India	39	2.64%
6	Indian journal of cryogenics	37	2.50%
7	Journal of earth system science	28	1.89%
8	Psychological studies	26	1.76%
9	Indian journal of physics	26	1.76%
10	IETE journal of research	25	1.69%
11	Sadhana - academy proceedings in engineering sciences	25	1.69%
12	Beverage and food world	24	1.62%
13	Journal of agricultural engineering	23	1.56%
14	Journal of chemical science	23	1.56%
15	Indian foundry journal	22	1.49%

4.6. Year wise distribution of citations of publications:

The year wise distribution of citation of publications is shown in the table 6. Among the highest citation and citation density the 125 publications with 132 citations and 1.056 citation density have received highest in the year 2006. The highest 163 were published in the year 2007 but slight down in the citation and citation density of 103 and 0.632 respectively.

Table 6: Year wise citation for Articles and Citation density

Sl.No.	Year	Articles	Citations	Citation density
1	2004	128	105	0.820
2	2005	133	117	0.880
3	2006	125	132	1.056
4	2007	163	103	0.632
5	2008	118	61	0.517
6	2009	116	94	0.810
7	2010	121	66	0.545
8	2011	102	37	0.363
9	2012	111	49	0.441
10	2013	92	26	0.283
11	2014	99	11	0.111
12	2015	100	8	0.080
13	2016	69	0	0.000

5. FINDING OF THE STUDY:

1. During January 2004 to December 2016 the highest numbers of Research Publications of Indian Institute of Technology kharagpur are published in the year 2007 as per ICI database.
2. The highest number of research publications published in the field of Engineering Science and Technology.
3. Suar Damodar is the most productive author with a highest contribution of 30 articles
4. Among 1477 publications, most of them are research articles.
5. Among the rank list of journals, Current Science and Journal of Food Science and Technology are in the top position.
6. The more number of citation and citation density were received for the publications of 2006 with 132 and 1.056 respectively.

6. CONCLUSION:

Indian Citation Index is an important tool to know the citation articles and citation density of research publications. ICI provides a multidisciplinary research platform covering about 1000 scholarly journals from India. ICI database interface is very user friendly with comprehensive citation coverage. In the present study to find out the research publications growth and author productivity, citation of articles and highly cited papers of Indian Institute of Technology, (IIT) kharagpur using the ICI data base was successfully carried out.

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