

# Research Output of Sinhgad Technical education Society (STES Pune) 2002-2020: A Bibliometric Study

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## **Abstract:**

The research outputs of the Sinhgad Technical Education Society, Pune are examined in this paper during 2002 to 2020 revealed in Scopus database (21.09.2020). Its purpose is to examine how STES (Sinhgad Technical Education Society) Pune has progressed and evolved its research output over time, as shown by the number of publications it has produced. A total of 1759 documents were acquired and reviewed to meet the objectives. This research examines the characteristics of these research outputs, such as Annual publications, subject wise publications, and communication patterns in means of document publication formats, country collaborations, authorship trends, and publishing language. Research outputs 221 in the year 2018, 738 records in computer science, 910 publications are in the form of articles, 26 publications are with USA collaboration are highest result. Authors of multi-authored documents are 2957 and Authors of single-authored documents are 30. Top most global cited documents is Bioorganic and Medicinal Chemistry by Kathiravan M.K.in the year 2012.The source received the total citations 370 and the total citation per year is 41.11. The most relevant source is the "International conference on pervasive computing: advance communication technology and application for society 2015".

**Keywords:** STES Pune, Research Output, Bibliometrics analysis, Research Productivity, Mapping Research activity, Institutional Productivity, Research Collaboration

## **Introduction:**

Several reports have previously been published that demonstrate the research output of various institutions and universities around the world as reflected in international databases such as Web of Science and Scopus. The aim of this research is to see how Sinhgad Technical Education Society Pune's research productivity has changed and evolved over time, as evidenced by the number of publications it has been made.

## **About Sinhgad Technical Education Society:**

The Sinhgad Technical Education Society (STES) in Pune is a prestigious institute with 12 campuses, 85 institutes and 26 schools as well as 70,000 plus students and 7000 plus employees who have completed 27 years in academics. The Sinhgad Technical Educational Institutes spread all over Maharashtra. It is benchmarked in every aspect. STES was founded in 1993 to make the vision of its visionary architect, Founder President Prof. M. N. Navale, a reality. The Sinhgad Group as a whole has established itself as the most coveted educational destination. Every Institute is NBA-accredited, AICTE-approved, and Savitribai Phule Pune University-affiliated. Smt. Kashibai Navale Medical College one of the college in STES subscribes to the code of the IMC. Every Institute has its own presence, complete with enviable state-of-the-art infrastructure and all of the necessary facilities and services to qualify as an ideal learning environment. Every campus of STES has a Research Center and a well-stocked library. It has Institutes under its umbrella that are run by competent and trained resource people from different disciplines The Sinhgad Educational conglomerate is still on the lookout for excellence. It spans over 500 acres of environmentally sustainable campuses.

## **Objectives of the Study:**

1. To evaluate research output of STES Pune annually from 2002-2020
2. To study the subject-wise research output of STES Pune.
3. To determine the types of documents published by STES Pune.
4. To find out the distribution of Author Productivity of STES Pune.

5. To study Country-wise collaboration of STES Pune
6. To find out Most Global cited Documents.
7. To find out the Most Relevant Source.

### Research Methodology:

The Scopus database is used in this investigation. The Scopus is multidiscipline bibliographic index of the journal publications. It is considered as a standard data source for the bibliometrics study of any Institutions or any subject. Therefore records required for this study have been collected from Scopus database published between the year 2002 and 2020. The query used for the search was “Sinhgad Technical Education Society”. As a result, 1759 records have been saved in the text files. Obtained records are imported for its year-wise analysis, subject-wise analysis, types of document published, authorship trends in publications, language of publication and Country Collaboration

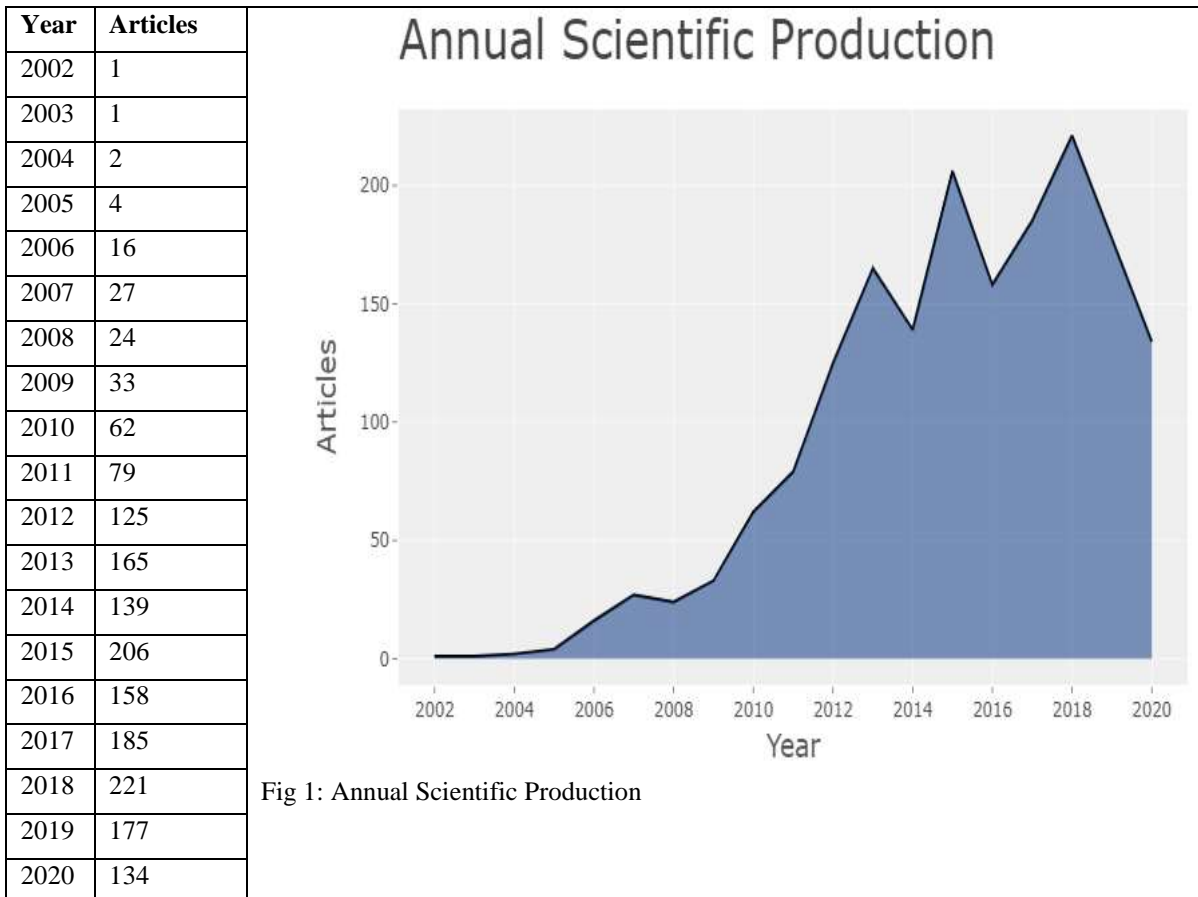
### Analysis of Data and Interpretation:

**Table No. 1: Main Information:**

Description	Results
<b>MAIN INFORMATION ABOUT DATA</b>	
Timespan	2002:2020
Sources (Journals, Books, etc)	705
Documents	1759
Average years from publication	4.84
Average citations per documents	6.988
Average citations per year per doc	1.048
References	42437
<b>DOCUMENT TYPES</b>	
Article	910
Book	1
book chapter	34
conference paper	731
Editorial	8
Erratum	5
Letter	4
Note	1
Review	63
short survey	2
<b>DOCUMENT CONTENTS</b>	
Keywords Plus (ID)	14121
Author's Keywords (DE)	5854
<b>AUTHORS</b>	
Authors	2987
Author Appearances	5846
Authors of single-authored documents	30
Authors of multi-authored documents	2957
<b>AUTHORS COLLABORATION</b>	
Single-authored documents	38

Documents per Author	0.589
Authors per Document	1.7
Co-Authors per Documents	3.32
Collaboration Index	1.72

**Table 2: Year-wise/ Annual Scientific Production:**



STES Pune started publishing its research in 2002. The rate of publication is progressively increasing, with ups and downs. 2018 is the year with the most publications. Table 1 shows the research productivity by year. Annual growth rate is 31.27%.

**Table 3: Subject-wise research output:**

SUBJECT AREA	
Agricultural and Biological Sciences	17
Arts and Humanities	2
Biochemistry, Genetics and Molecular Biology	164
Business, Management and Accounting	33
Chemical Engineering	108
Chemistry	174
Computer Science	738
Decision Sciences	44
Dentistry	3
Earth and Planetary Sciences	12
Economics, Econometrics and Finance	8

Energy	113
Engineering	667
Environmental Science	64
Health Professions	4
Immunology and Microbiology	16
Materials Science	114
Mathematics	160
Medicine	130
Multidisciplinary	18
Neuroscience	21
Nursing	2
Pharmacology, Toxicology and Pharmaceutics	411
Physics and Astronomy	139
Psychology	3
Social Sciences	56

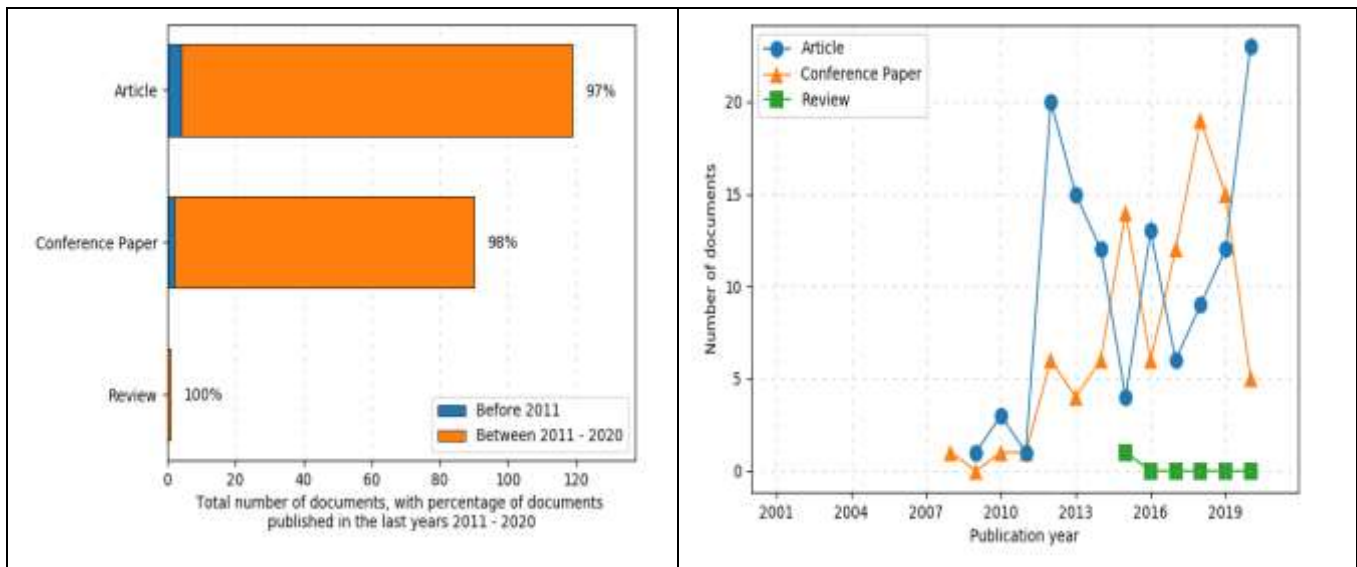
The research trend in STES catogerised subject-wise. Computer Science is the most active research field in STES Pune. Engineering at second and Pharmacology, Toxicology and Pharmaceutics at third position in terms of the research output.

**Table 4: Document Types:**

Sr. No.	Document Types	Record Count	% of 1759
1.	Article	910	51.733
2.	Book	1	0.0568
3.	book chapter	34	1.932
4.	conference paper	731	41.557
5.	Editorial	8	0.454
6.	Erratum	5	0.284
7.	Letter	4	0.227
8.	Note	1	0.0568
9.	Review	63	3.581
10.	short survey	2	0.113

Table 4 gives the details of the sorts of document that was published. The highest number of publications was in the form of articles and it is 910 next by conference papers the number was 731, reviews are 63, and book chapters are 34 in numbers. Therefore, articles 51.733%, conference paper 41.557%, Review3.581% and Book Chapter 1.932%.

**Fig 2: Document Type**



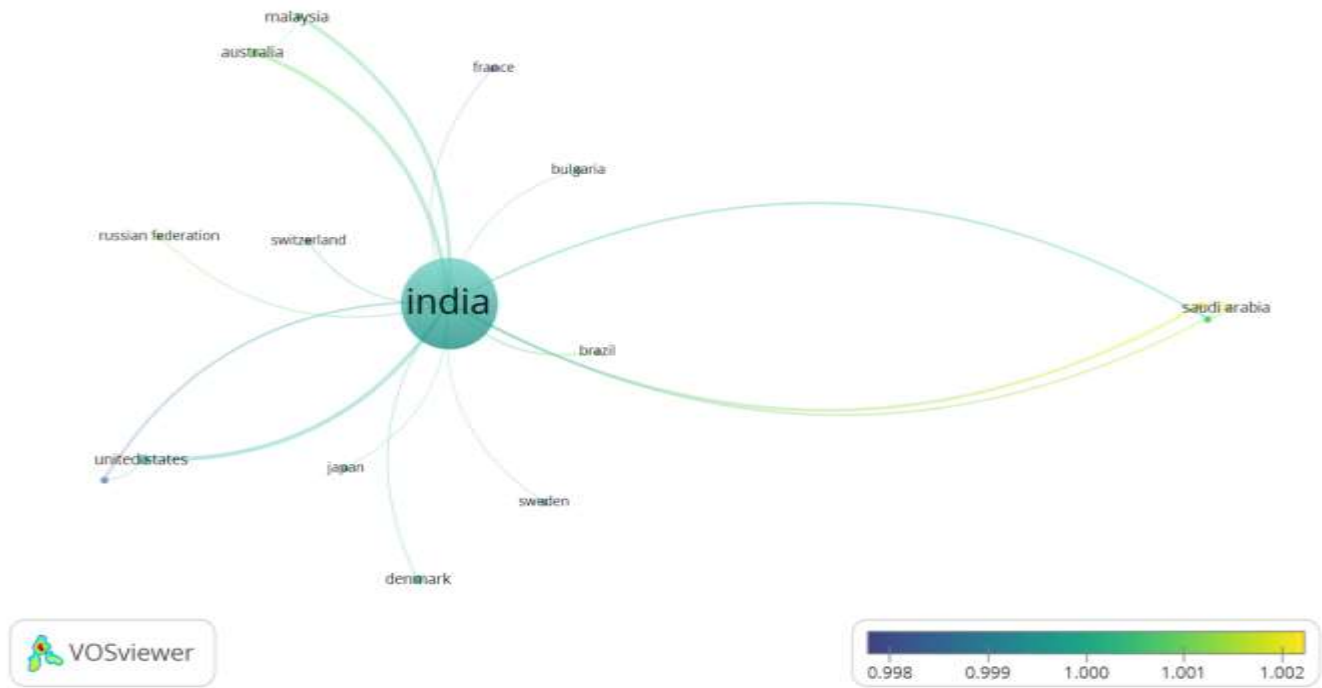
**Table 5: world collaboration**

Collaboration analysis gives a broad perspective of scientific collaboration of the research communities at various levels of aggregation. Countries and authors were used as the analysis units in this study.

**Country-wise Collaboration**

From	To	Frequency	From	To	Frequency
INDIA	AUSTRALIA	18	INDIA	JAPAN	1
INDIA	AUSTRIA	1	INDIA	KOREA	5
INDIA	BANGLADESH	1	INDIA	MALAYSIA	13
INDIA	BRAZIL	4	INDIA	NAMIBIA	1
INDIA	BULGARIA	2	INDIA	NEPAL	3
INDIA	CANADA	1	INDIA	NETHERLANDS	2
INDIA	CHINA	6	INDIA	PAKISTAN	3
INDIA	CROATIA	7	INDIA	PORTUGAL	4
INDIA	CYPRUS	3	INDIA	SAUDI ARABIA	9
INDIA	DENMARK	20	INDIA	SERBIA	3
INDIA	EGYPT	4	INDIA	SOUTH AFRICA	4
INDIA	FRANCE	2	INDIA	SPAIN	2
INDIA	GREECE	3	INDIA	SWEDEN	1
INDIA	HUNGARY	2	INDIA	SWITZERLAND	1
INDIA	INDONESIA	1	INDIA	UNITED KINGDOM	5
INDIA	IRAN	3	INDIA	USA	26
INDIA	ITALY	5			

**Fig 3: Country-wise Collaboration**



**Table 6: Country scientific production**

Region	Freq	Region	Freq
INDIA	3409	SERBIA	6
USA	44	SOUTH KOREA	6
AUSTRALIA	28	EGYPT	5
DENMARK	21	UK	5
MALAYSIA	14	BRAZIL	4
SAUDI ARABIA	12	SOUTH AFRICA	4
ITALY	11	SPAIN	4
CROATIA	7	CYPRUS	3
CHINA	6	GREECE	3
PORTUGAL	6	HUNGARY	3

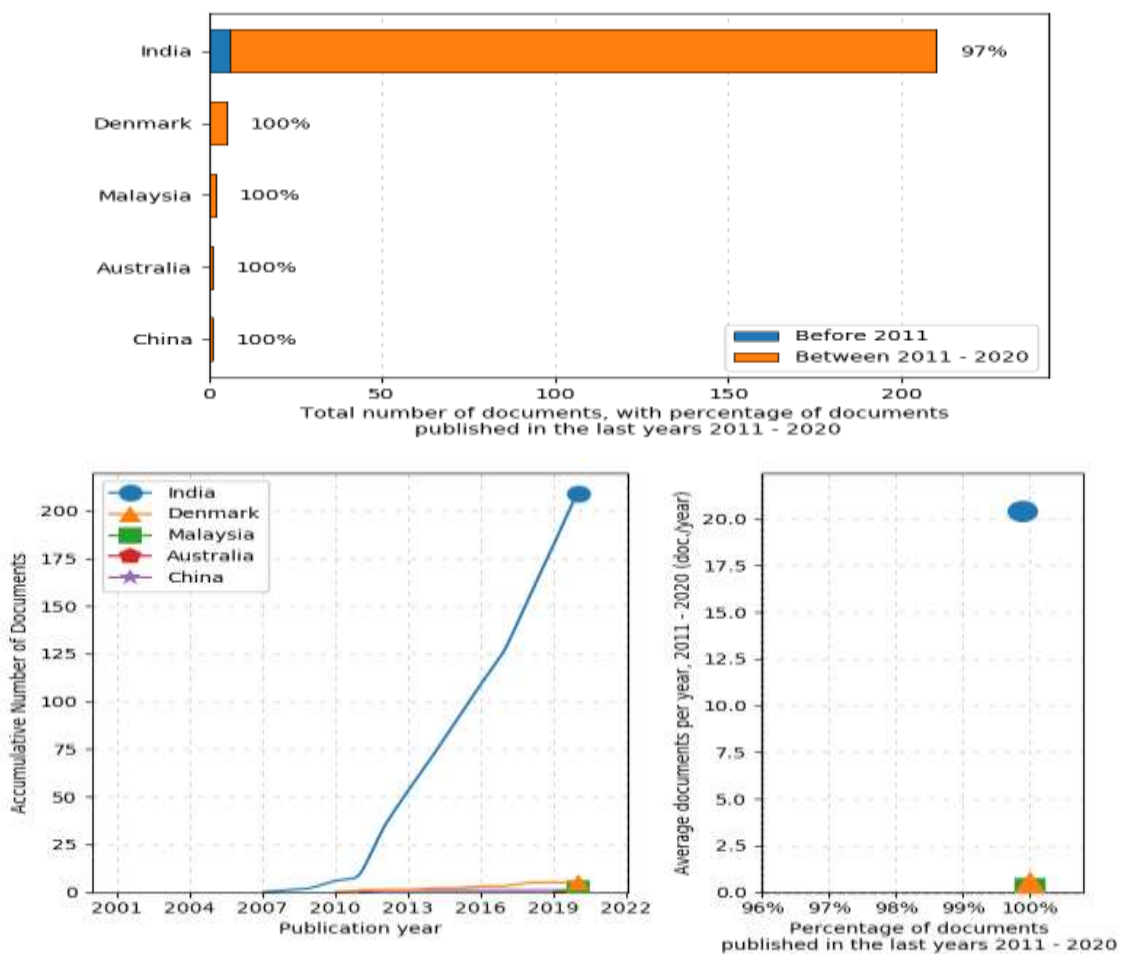
Fig 4: Country scientific production

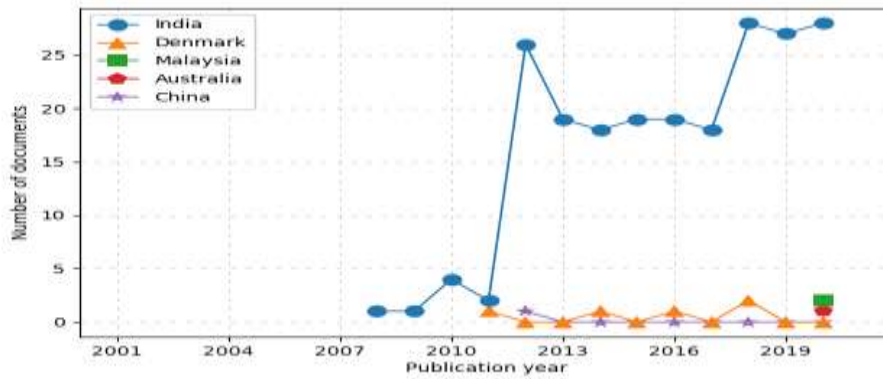
## Country Scientific Production



Different shades of the blue color in the above plot represent different productivity level like dark blue color Indicating high productivity rate while grey color indicates no articles means zero productivity rate of the country.

The distribution of scientific production frequencies worldwide by affiliation of the country is depicted in Figure no. 4 and Table no.6. Within the Top 5 countries, we admire how India is in the first place with (3409 frequency) and the United States is in the second place with (44 frequency) which is followed by the Australia with (28 frequency), Denmark (21 frequency), and Malaysia in the fifth place (14 freq.).





**Table 7: Distribution of Author Productivity**

Documents written	N. of Authors	Proportion of Authors	Documents written	N. of Authors	Proportion of Authors
1	2017	0.675	15	5	0.002
2	480	0.161	16	3	0.001
3	174	0.058	17	2	0.001
4	101	0.034	18	4	0.001
5	54	0.018	19	2	0.001
6	38	0.013	21	2	0.001
7	25	0.008	22	1	0
8	20	0.007	23	1	0
9	20	0.007	24	2	0.001
10	14	0.005	30	1	0
11	7	0.002	43	1	0
12	6	0.002	46	1	0
13	4	0.001	54	1	0
14	1	0			

Table 7 present Distribution of author productivity means no. of documents written and proportion of the author. The single documents written by most (2017) 0.675 proportion of authors. Two documents written by (480) 0.161 proportion of authors, then three documents written by (174) 0.058 proportion of authors.

**Research Output of STES Language wise:**

**Table 8: Publication and the Languages**

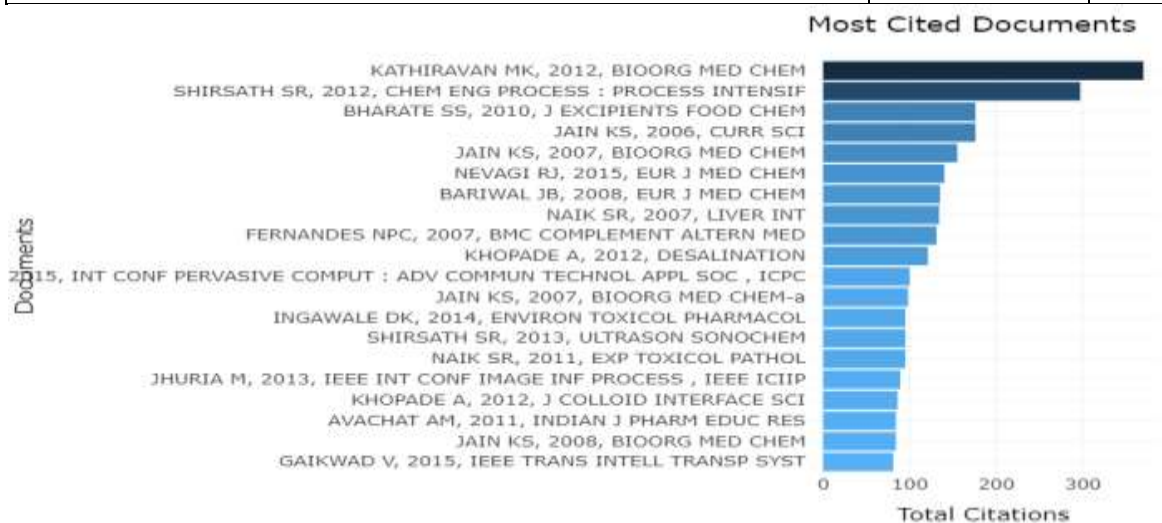
Sr. No.	Language	Record	% of 1759
1	English	1759	100

Above table no.8 shows the publication's languages. STES Pune has released all of its publications in English also English is considered as a global language in today's scenario.



**Table No.9: Most Global cited Documents**

Paper	Total Citations	TC per Year
KATHIRAVAN MK, 2012, BIOORG MED CHEM	370	41.1111
SHIRSATH SR, 2012, CHEM ENG PROCESS : PROCESS INTENSIF	297	33
BHARATE SS, 2010, J EXCIPIENTS FOOD CHEM	176	16
JAIN KS, 2006, CURR SCI	176	11.7333
JAIN KS, 2007, BIOORG MED CHEM	155	11.0714
NEVAGI RJ, 2015, EUR J MED CHEM	140	23.3333
BARIWAL JB, 2008, EUR J MED CHEM	135	10.3846
NAIK SR, 2007, LIVER INT	134	9.5714
FERNANDES NPC, 2007, BMC COMPLEMENT ALTERN MED	131	9.3571
KHOPADE A, 2012, DESALINATION	121	13.4444
PONGLE P, 2015, INT CONF PERVASIVE COMPUT : ADV COMMUN TECHNOL APPL SOC , ICPC	100	16.6667
JAIN KS, 2007, BIOORG MED CHEM-a	98	7
INGAWALE DK, 2014, ENVIRON TOXICOL PHARMACOL	95	13.5714
SHIRSATH SR, 2013, ULTRASON SONOCHEM	95	11.875
NAIK SR, 2011, EXP TOXICOL PATHOL	95	9.5
JHURIA M, 2013, IEEE INT CONF IMAGE INF PROCESS , IEEE ICIP	89	11.125
KHOPADE A, 2012, J COLLOID INTERFACE SCI	86	9.5556
AVACHAT AM, 2011, INDIAN J PHARM EDUC RES	84	8.4
JAIN KS, 2008, BIOORG MED CHEM	84	6.4615
GAIKWAD V, 2015, IEEE TRANS INTELL TRANSP SYST	81	13.5



**Fig 5: Most Global Cited Documents**

Above table 9 and figure 5 shows that the top most global cited documents is Bioorganic and Medicinal Chemistry by Kathiravan M.K.in the year 2012.The source received the total received citations 370 and the total citation per year is 41.11.

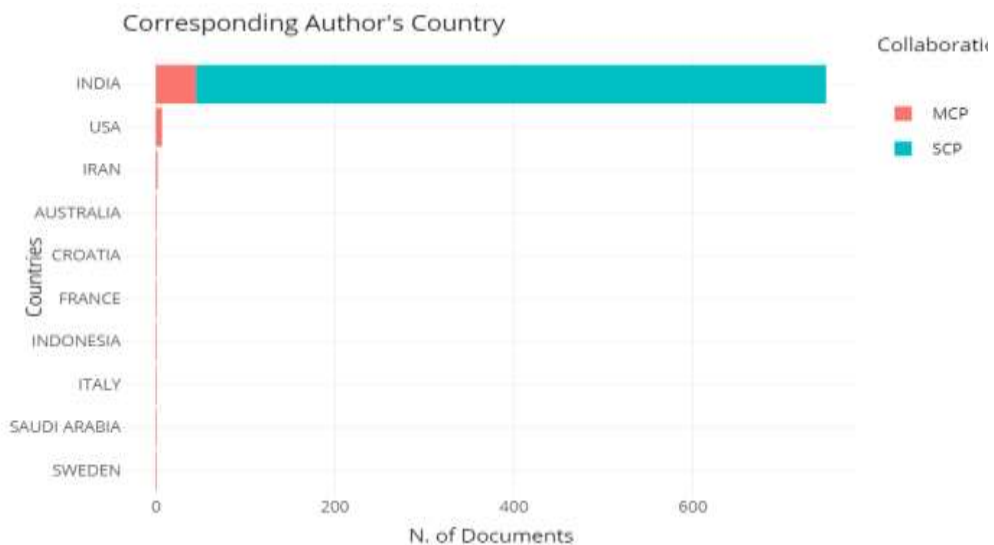
**Table No. 10: Corresponding Authors country/ Countries Production and the collaborations**

Country	Articles	Freq	SCP	MCP	MCP_Ratio
INDIA	749	0.97908	704	45	0.0601
USA	7	0.00915	0	7	1
IRAN	2	0.00261	0	2	1
AUSTRALIA	1	0.00131	0	1	1
CROATIA	1	0.00131	0	1	1
FRANCE	1	0.00131	0	1	1
INDONESIA	1	0.00131	0	1	1
ITALY	1	0.00131	0	1	1
SAUDI ARABIA	1	0.00131	0	1	1
SWEDEN	1	0.00131	0	1	1

Country denotes the location of the relevant author's affiliation. Articles give information about number of articles per country of association of the corresponding author; SCP refers to the "Single country Publication". MCP stands for "Multi-Country Publication."

The ratio between the number of multi-country collaborations and the overall number of papers published was analysed in the corresponding author's affiliation (Table 10). The United States has the most cross-country collaborations (07 multi-country collaborations),

**Fig 6: Corresponding Authors country**

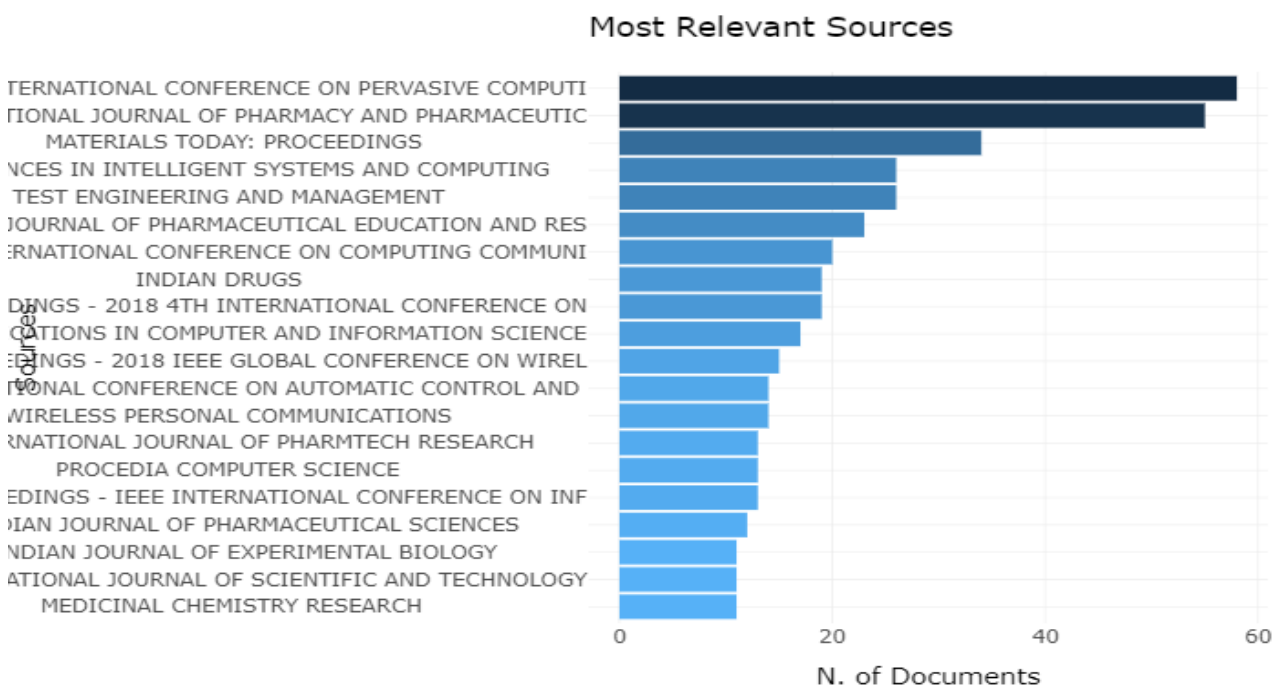


The plot above depicts the author's correspondence countries in each publication, with the total number of collaboration calculated as a single country collaboration not multiple country collaboration, or collaboration between multiple countries. The document number interval is between zero and more than seven hundred published documents or publications with the affiliation of STES, and there are ten top countries take into account. According to the findings, India ranks first as the country with the most author correspondence, with the most author correspondence with more than seven hundred articles published. Furthermore, the United States is ranked second with less than seven publications output.

**Table No. 11: Most relevant Sources**

Sources	Articles
2015 INTERNATIONAL CONFERENCE ON PERVASIVE COMPUTING: ADVANCE COMMUNICATION TECHNOLOGY AND APPLICATION FOR SOCIETY ICPC 2015	58
INTERNATIONAL JOURNAL OF PHARMACY AND PHARMACEUTICAL SCIENCES	55
MATERIALS TODAY: PROCEEDINGS	34
ADVANCES IN INTELLIGENT SYSTEMS AND COMPUTING	26
TEST ENGINEERING AND MANAGEMENT	26
INDIAN JOURNAL OF PHARMACEUTICAL EDUCATION AND RESEARCH	23
2017 INTERNATIONAL CONFERENCE ON COMPUTING COMMUNICATION CONTROL AND AUTOMATION ICCUBEA 2017	20
INDIAN DRUGS	19
PROCEEDINGS - 2018 4TH INTERNATIONAL CONFERENCE ON COMPUTING COMMUNICATION CONTROL AND AUTOMATION ICCUBEA 2018	19
COMMUNICATIONS IN COMPUTER AND INFORMATION SCIENCE	17
PROCEEDINGS - 2018 IEEE GLOBAL CONFERENCE ON WIRELESS COMPUTING AND NETWORKING GCWCN 2018	15
INTERNATIONAL CONFERENCE ON AUTOMATIC CONTROL AND DYNAMIC OPTIMIZATION TECHNIQUES ICACDOT 2016	14
WIRELESS PERSONAL COMMUNICATIONS	14
INTERNATIONAL JOURNAL OF PHARMTECH RESEARCH	13
PROCEDIA COMPUTER SCIENCE	13
PROCEEDINGS - IEEE INTERNATIONAL CONFERENCE ON INFORMATION PROCESSING ICIP 2015	13
INDIAN JOURNAL OF PHARMACEUTICAL SCIENCES	12
INDIAN JOURNAL OF EXPERIMENTAL BIOLOGY	11

**Fig 7: Most Relevant Sources**



From table No. 11 ,INTERNATIONAL CONFERENCE ON PERVASIVE COMPUTING: ADVANCE COMMUNICATION TECHNOLOGY AND APPLICATION FOR SOCIETY ICPC 2015 with 58 Article and second one is INTERNATIONAL JOURNAL OF PHARMACY AND PHARMACEUTICAL SCIENCES with 55 Articles published and Third one is MATERIALS TODAY: PROCEEDINGS with 34 articles published.

### Conclusion:

According to the study take place STES Pune has 1759 total research outputs from the year 2002 to 2020. Year by Year the research outputs go on increasing which is started with one in the year 2002. In the year 2018 total number of the research output was 221 which is the highest one. The subject Computer Science has produced 738 records/ research publications followed by 667 in engineering, 411 in Pharmacology, Toxicology, and Pharmaceutics. In total documents published articles was 910 (51.733%) records followed by 731(41.557%) conference paper and 63(3.581%) reviews and 34(1.932%) book chapters and 21(1.197%) others are book, editorial, erratum, letter, note and short survey.

English language used by most of the authors to publish their research. Top most global cited documents is Bioorganic and Medicinal Chemistry by Kathiravan M.K.in the year 2012 it was received the total citations 370 and the total citation per year is 41.11. International conference on pervasive computing: advance communication technology and application for society icpc 2015 is the most relevant source of publication

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