



Research Publication Analysis of Faculty Members of Gauhati University during 1989-2018: A Bibliometric Study

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Abstract

The paper presents a bibliometric study of the research publication output of faculty members of Gauhati University for 30 years (1989-2018). During this period, 2081 articles were published. The data is collected from the Web of Science (WoS). The study attempts to measure the year-wise distribution of publications output, growth rate, compound annual growth rate, relative growth rate, and doubling time of articles. The study also analyzes the authorship pattern, author productivity and degree of collaboration of articles. The results of the study indicate that the highest maximum number of 199(9.56%) articles were published in 2016 and the lowest 8(0.38%) articles were published in the year 1992. Highest 683 (32.82%) articles were contributed by two authored pattern followed by more than four authored articles 543(26.09%) during the period of study.

Keywords: Gauhati University, Bibliometrics, Faculty Research Publication, Web of Science, Annual Growth Rate, Compound Annual Growth Rate, Relative Growth Rate

1. Introduction

In recent times, the quantitative study to measure the research output of the academic community of institutions has become popular. This study is known as "Bibliometric Study". Alan Pritchard was the person who defined the term bibliometrics for the first time (1969) as "bibliometrics is the



application of mathematics and statistical methods to books and other media of communication". In any Higher Educational Institutions (HEIs) every faculty member is viewed as scientist (Gautam, 2015). By contributing effective journal articles, Gauhati University has played a crucial role in the shaping of a good academic world of research.

1.1 Gauhati University: an Over view

Gauhati University is the oldest University in North East India. It is a state university that was established in the year 1948. It is located at Jalukbari of Kamrup district. The university consists of 41 departments under 7 faculties and two institutes named- Institute of Science and Technology and Institute of Distance and Open Learning (IDOL). The total strength of students in Guwahati University is about 6000. University has good established library with more than 3 lakhs printed and non-printed material and ICT infrastructure. (<http://www.gauhati.ac.in>>notification)

2. Literature Review

Shukla et al. (2019) analyzed a bibliometric study on the pattern of research publication of faculties of library and information science department, Mizoram University, Aizawl. The period of the study was 2008-2017. For the study, 279 papers were taken from the Department of Library & Information Science, Mizoram University. The survey and observation method of research was used in this study and analyzed by Microsoft Excel sheet. In the year 2017, the highest 61 number of papers were published. The study showed that 119 journal articles, 93 conference proceedings, 67 books, and book chapters were published from 2008-2017. The study also analyzed that in the year 2017, the highest numbers of 61(21.86%) research papers were published and the maximum annual growth rate was 366.67 in the year 2010. The maximum relative growth rate (RGR) was 1.099 in the year 2010. Gau, Shukla and Verma, (2018) mapped the research productivity of faculties of Library & information science faculties of Babasaheb Bhimrao Ambedkar University Lucknow on the basis of different bibliometric parameters. Darmadji et al. (2018) analyzed the research productivity of Universities of Indonesia. It also analyzed the international collaboration of top Indonesian Universities. Top ten universities were taken for the study where data collection was done through Scopus. The study represented that before 2000 the progress was slow. But, after 2010 the numbers of published documents were highly increased. The study did not focus on higher educational institutions in Indonesia because there were almost two thousand higher institutions there. The study also analyzed that collaboration with local industries and institutions can help the universities. They reported that to improve the quality of Indonesian higher education, top Indonesian universities and governments should consider increasing collaboration with other



national universities.

Starovoytova (2017) conducted a study on research output of engineering school. The study focused on the number of publications per faculty member. It was conducted with a small sample size (15) and the study evaluated total and average annual research output of faculty members of an engineering school, over their publication career. Research output was evaluated based on academic-rank, teaching-experience, age, gender, and the field of engineering and questionnaires, interviews were used for data collection. The study revealed that in their publishing career, the sample faculty published, cumulatively 230 papers, which is just one measurement of research productivity. But, it reflected nothing, about their quality. Gautam and Mishra (2015) conducted a study on research growth of Banaras Hindu University during 2004-2013 based on the Indian Citation Index (ICI). The study focuses on the growth and productivity of publications from BHU during the marked period on the basic of year-wise distribution of publication output, co-authorship index, collaborative co-efficient collaborating etc. The results indicate that research productivity of Banaras Hindu University is increasing at the average rate of 104.1 publications per year; most of the researches are contributed by joint authorship. Sheeja et al. (2015) conducted a study on the research output of six state universities of Kerala. For the data collection of the study, the Scopus database of Elsevier was used. A total of 11764 documents were published by these universities during 2009-2013. Out of six universities, Cochin University Science and Technology (CUSAT) was a top-ranking university in research productivity. According to the study, Astronomy, Physics, Chemistry, Material Science and Engineering departments were doing good researches in comparison to other departments in Kerela.

Goodall et al. (2014) conducted a study on research output and leadership of university departments. This study analyzed data on chairpersons of departments in 58 US universities for 15 years (1995-2010). The study evaluated that, departmental research productivity was increased by highly citing department Chair's publications. Adams and Griliches (1998) conducted a study on the output of research in a system of universities. The study focused on the research trends of a system in sciences and universities. Small samples from the leading universities were taken for the study. The relationship between research & development and research productivity in eight different fields of science was focused on the study. The study also suggested that leading university has lower average and marginal cost of performing research.

3. Objectives

The objectives of the study are:

1. To analyze the growth and distribution of the articles during the period of study 1989-2018
2. To identify the Annual Growth Rate (AGR) and Compound Annual Growth Rate (CAGR) of articles
3. To identify the Relative Growth Rate (RGR) and Doubling Time (DT) of articles
4. To analyze the Authorship Pattern, Author Productivity and Degree of Collaboration of articles
5. To find out the top source titles and funding agencies

4. Research Methodology

The most important and necessary part of a research study is data collection. The present study is a bibliometric study of the publications of faculty members of Gauhati University. For the research study, data were collected from the Web of Science database. The data were collected from the WoS database using the tag OO= (Gauhati University OR Guwahati University). The Timespan of data is 1989-2018. 2081 results were found from WoS core collection and using MS-Excel sheet data was analyzed and presented in tabulated form. Different formulas were used to measure different parameters of the analysis like-

$$AGR = \frac{(End\ value - First\ value)}{first\ value} \times 100 \text{ for Annual Growth Rate of Publications,}$$

$$CAGR = \left[\left(\frac{Ending\ value}{Beginning\ value} \right)^{\frac{1}{n}} - 1 \right] \text{ for Compound Annual Growth of Rate,}$$

$$RGR = \frac{W_2 - W_1}{T_2 - T_1} \text{ for Relative Growth Rate,}$$

$$DT = \frac{0.693}{R} \text{ for Doubling Time,}$$

$$DC = \frac{Nm}{Nm + Ns} \text{ for Degree of Collaboration of Publications.}$$

5. DATA ANALYSIS

5.1. Growth of Publications

Table and Figure 1 show the growth of publications of articles published by the faculty members of Gauhati University during the period of 1989-2018. The year-wise analysis reveals that out of a total of 2081 articles, the maximum number 199 (9.56%) of articles were published in the year 2016, followed by 196 (9.42%) contributions in the year 2017. Figure1 represents that the growth



was slow from the year 1989-2007 and it was almost the same from 1989 to 1992 and only 14, 13, 11 and 8 articles was published in the years 1989, 1990, 1991, 1992 respectively. But, in the year 2008, the growth rate of publications was increased to 100 numbers. In the year 2009, it was decreased to 63 numbers and after that, the growth rate was increased gradually at a satisfactory level. Minimum number 8 (0.38%) of articles were published in the year 1992.

Table 1

Growth of Publications

Year	Number of articles	Percentage
1989	14	0.67
1990	13	0.62
1991	11	0.53
1992	8	0.38
1993	26	1.25
1994	20	0.96
1995	23	1.11
1996	20	0.96
1997	22	1.06
1998	28	1.35
1999	33	1.59
2000	28	1.35
2001	26	1.25
2002	20	0.96
2003	35	1.68
2004	45	2.16
2005	35	1.68
2006	53	2.55
2007	58	2.79
2008	100	4.81
2009	63	3.03
2010	87	4.18
2011	93	4.47
2012	144	6.92
2013	159	7.64
2014	161	7.74
2015	175	8.41
2016	199	9.56
2017	196	9.42



2018	186	8.94
Total	2081	100.00

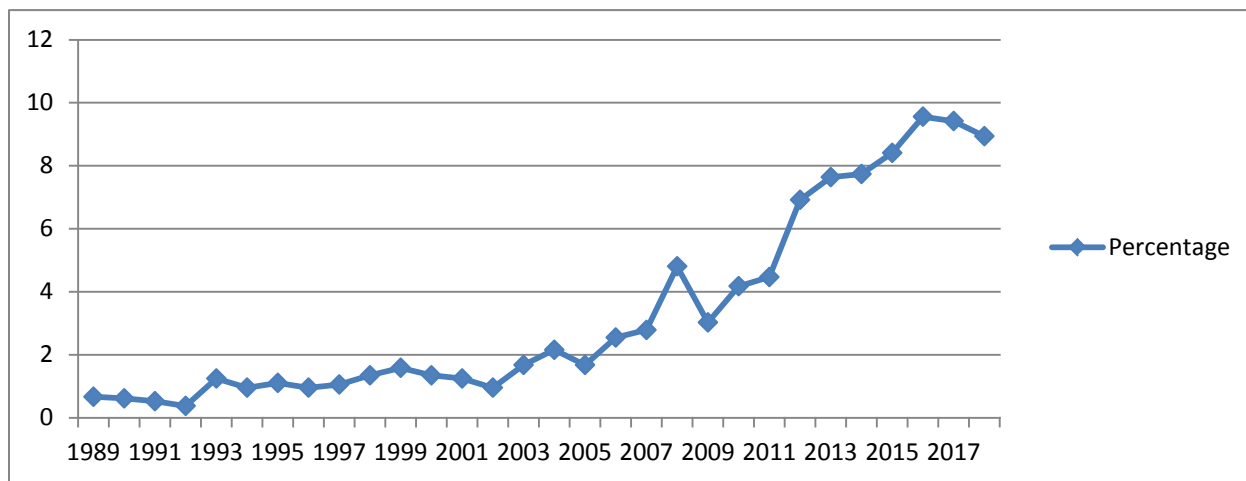


Fig. 1: Growth of Publications

6.2. Annual Growth Rate (AGR) of the Publications

Table and Figure 2 describe the annual growth rate articles published by faculty members of Gauhati University from the year 1989 to 2018. The AGR is measured by subtracting first value from end value then dividing by first value. Then the result is multiplied by 100 to get AGR. The highest growth rate was 19800 in the year 2016, followed by 19500 recorded in the year 2016. The lowest AGR rate was 700 in the year 1992. Figure2 represents that the rate of annual growth was not stable every year. It was suddenly increased in 2008 to 9900. Earlier in 2007 AGR was 5700. Again it was fallen to 6200 in 2009. The minimum difference of AGR was 200 between the years 1996-1997(1900-2100) and 2013-2014(15800-16000). It is found that there was continuous growth from 2012-2016.

The mathematical formula was given by Kumar and Kaliyaperumal in 2015 and that is given below-

$$AGR = \frac{(End\ value - First\ value)}{first\ value} \times 100$$

Table 2
Annual Growth Rate of Publications

Year	Number of articles	AGR
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1989	14	0
1990	13	1200
1991	11	1000
1992	8	700
1993	26	2500
1994	20	1900
1995	23	2200
1996	20	1900
1997	22	2100
1998	28	2700
1999	33	3200
2000	28	2700
2001	26	2500
2002	20	1900
2003	35	3400
2004	45	4400
2005	35	3400
2006	53	5200
2007	58	5700
2008	100	9900
2009	63	6200
2010	87	8600
2011	93	9200
2012	144	14300
2013	159	15800
2014	161	16000
2015	175	17400
2016	199	19800
2017	196	19500
2018	186	18500

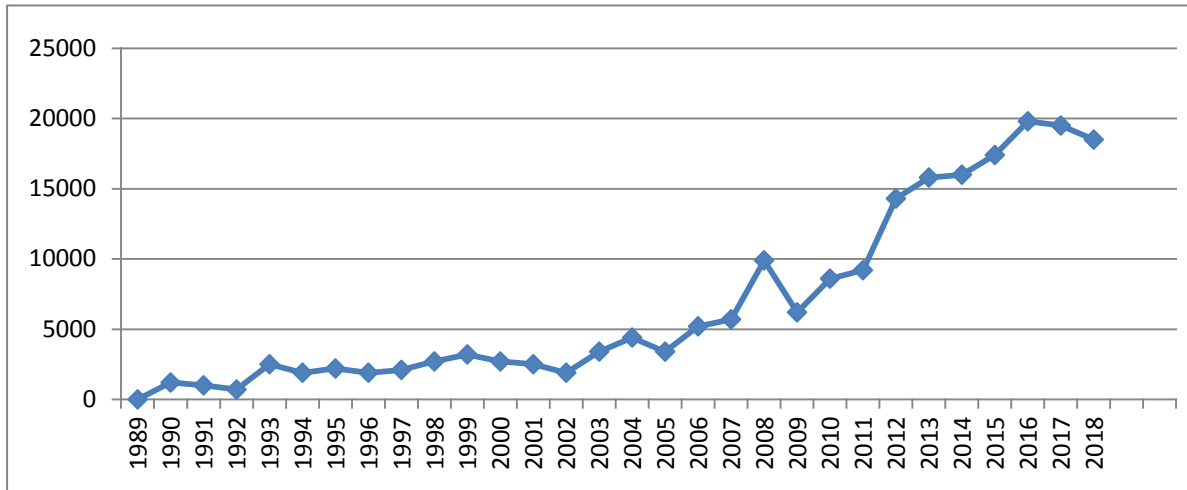


Fig. 2: Annual Growth Rate of Publications

5.3. Compound Annual Growth Rate (CAGR) of Publications

Table 3 and figure 3 reflects analysis of compound annual growth rate of the total publications of faculty members of Gauhati University during the period 1989-2018. The compound annual growth rate (CAGR) is measured by taking the nth root of the total percentage growth rate, where n is the number of periods (Shula, 2019). Here, year considered as n. There was no specific stable growth every year during the period of study. So, the fluctuation is in CAGR also. The CAGR was lower than previous year in the years 1990(-0.036), 1991(-0.080), 1992(-0.147), 1994(-0.123), 1996(-0.067), 2000(-0.079), 2001(-0.036), 2002(-0.123), 2005(-0.118), 2009(-0.206), 2017(-0.008), 2018(-0.026). CAGR is calculated by the following mathematical formula which is available on <https://www.investopedia.com/ask/answers/071014/what-formula-calculating-compound-annual-growth-rate-cagr-excel.asp>

$$CAGR = \left[\left(\frac{\text{Ending value}}{\text{Beginning value}} \right)^{\frac{1}{n}} - 1 \right]$$

Table 3

Compound Annual Growth Rate (CAGR) of Publications

Year	Number of articles	CAGR
1989	14	0
1990	13	-0.036



1991	11	-0.080
1992	8	-0.147
1993	26	0.803
1994	20	-0.123
1995	23	0.072
1996	20	-0.067
1997	22	0.049
1998	28	0.128
1999	33	0.086
2000	28	-0.079
2001	26	-0.036
2002	20	-0.123
2003	35	0.323
2004	45	0.134
2005	35	-0.118
2006	53	0.231
2007	58	0.046
2008	100	0.313
2009	63	-0.206
2010	87	0.175
2011	93	0.034
2012	144	0.244
2013	159	0.051
2014	161	0.006
2015	175	0.043
2016	199	0.066
2017	196	-0.008
2018	186	-0.026

5.4. Relative Growth Rate and Doubling Time of Publications

Table 4 and figure 3 describes that the relative growth rate and doubling time of publications of the faculty members of Gauhati University during the period (1989-2018). The maximum RGR was 2.68 in the year 2002. The minimum RGR was 0.73 in the year 1990. The table shows that the RGR was continuously increased from 1993 to 1997 (1.02-1.97). In 1998, it was fallen to 1.89. In 1998 and 1999, it remained constant (1.89). From 2000-2018, RGR was around 2.17-2.68 excluding 2008 (1.82), 2012(1.94), 2013(1.99).

RGR is calculated by following formula-



$$RGR = \frac{W2 - W1}{T2 - T1}$$

Here, W2 = Log_e(Natural Log of beginning no. of publication)

W1 = Log_e(Natural Log of ending no. of publication)

T2 = Ending Time

T1 = Beginning Time

Table 4 also describes the doubling time of articles. DT was the highest 0.95 in the year 1990. It was the lowest of 0.26 in the year 2002. Here, DT was continuously decreased from 1993 to 1997 (0.68-0.35). In 1998, it was increased to 0.37. In 1998 and 1999, it remained constant (0.37). It also remained constant in the year 2015(0.32) and 2016 (0.32). Mahapatra developed a doubling time model in 1985. It is calculated by following formula-

$$\text{Doubling Time} = \frac{0.693}{R}$$

Where, R can represent the mean relative growth rate per unit of articles per unit of year over a specific period of interval (Kumar, 2015).

Table 4
Relative Growth Rate and Doubling Time of Publications

Year	Number of Articles	Cumulative sum	W1	W2	RGR	DT
1989	14	14	0	2.64	0	0
1990	13	27	2.56	3.30	0.73	0.95
1991	11	38	2.40	3.64	1.24	0.56
1992	8	46	2.08	3.83	1.75	0.40
1993	26	72	3.26	4.28	1.02	0.68
1994	20	92	3.00	4.52	1.53	0.45
1995	23	115	3.14	4.74	1.61	0.43
1996	20	135	3.00	4.91	1.91	0.36
1997	22	157	3.09	5.06	1.97	0.35
1998	28	185	3.33	5.22	1.89	0.37
1999	33	218	3.50	5.38	1.89	0.37
2000	28	246	3.33	5.51	2.17	0.32
2001	26	272	3.26	5.61	2.35	0.30
2002	20	292	3.00	5.68	2.68	0.26
2003	35	327	3.56	5.79	2.23	0.31
2004	45	372	3.81	5.92	2.11	0.33

2005	35	407	3.56	6.01	2.45	0.28
2006	53	460	3.97	6.13	2.16	0.32
2007	58	518	4.06	6.25	2.19	0.32
2008	100	618	4.61	6.43	1.82	0.38
2009	63	681	4.14	6.52	2.38	0.29
2010	87	768	4.47	6.64	2.18	0.32
2011	93	861	4.53	6.76	2.23	0.31
2012	144	1005	4.97	6.91	1.94	0.36
2013	159	1164	5.07	7.06	1.99	0.35
2014	161	1325	5.08	7.19	2.11	0.33
2015	175	1500	5.16	7.31	2.15	0.32
2016	199	1699	5.29	7.44	2.14	0.32
2017	196	1895	5.28	7.55	2.27	0.31
2018	186	2081	5.23	7.64	2.41	0.29

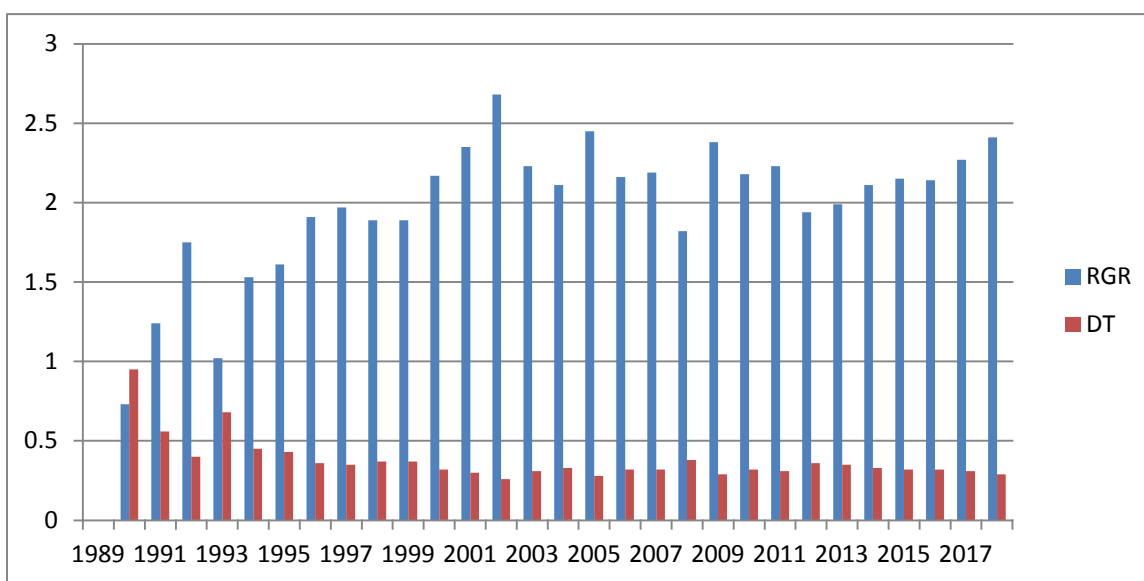


Fig. 3: Relative Growth Rate and Doubling Time of Publications

5.5 Authorship Pattern

Table 5 and Figure 4 represents that out of total 2081 articles 97(4.66%) are contributed by single-authored, 683(32.82%) by double-authored, 454(21.82%) by triple authored 304(14.61%) by four authored and 543(26.09%) by more than four authored. The data analyses that the highest 683 (32.82%) articles were contributed by two authored. More than four authored contributions was stood in second rank with the 543(26.09%) articles. Data also revealed that the lowest 97(4.66%) number of articles were contributed by single-authored. Figure 4 shows pin-pointedly the



authorship pattern of the total of 2081 articles of the faculty members of Gauhati University during the time 1989 to 2018.

Table 5
Authorship Pattern

S. No.	Year	Single	Double	Triple	Four	More than four	Total
1.	1989	7	5	2	0	0	14
2.	1990	8	3	1	0	1	13
3.	1991	5	4	1	1	0	11
4.	1992	1	5	2	0	0	8
5.	1993	2	13	7	1	3	26
6.	1994	4	7	4	4	1	20
7.	1995	3	11	5	3	1	23
8.	1996	3	8	7	2	0	20
9.	1997	3	14	4	0	1	22
10.	1998	1	13	10	3	1	28
11.	1999	1	14	11	6	1	33
12.	2000	2	11	11	4	0	28
13.	2001	2	9	6	6	3	26
14.	2002	2	11	6	1	0	20
15.	2003	2	11	12	6	4	35
16.	2004	6	15	7	8	9	45
17.	2005	1	17	7	4	6	35
18.	2006	2	23	14	9	5	53
19.	2007	1	22	18	8	9	58
20.	2008	5	37	30	17	11	100
21.	2009	3	25	10	8	17	63
22.	2010	4	35	25	13	10	87
23.	2011	3	34	27	14	15	93
24.	2012	1	56	28	19	40	144
25.	2013	8	69	38	11	33	159
26.	2014	5	45	29	31	51	161
27.	2015	2	51	32	25	65	175
28.	2016	5	34	41	28	91	199
29.	2017	3	35	31	40	87	196
30.	2018	2	46	28	32	78	186
Total		97	683	454	304	543	2081

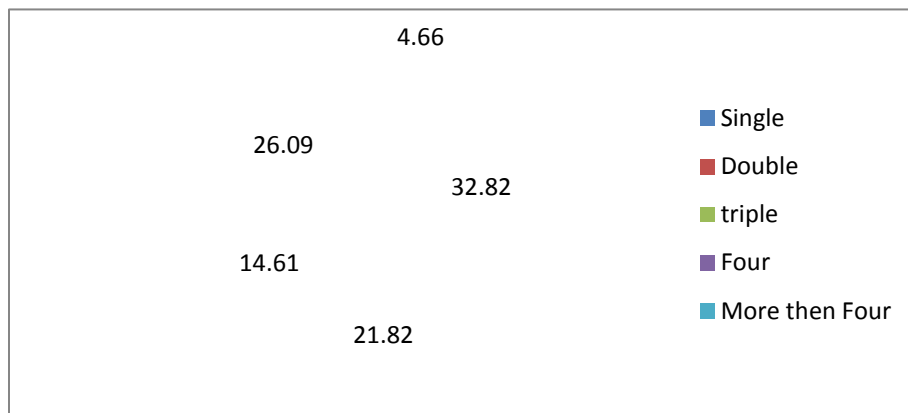


Fig. 4: Authorship Pattern

5.6 Degree of Collaboration

Table 6 represents the degree of collaboration of articles published during 1989-2018 by the Guwahati University and analysis reveals that the average degree of collaboration is 0.95 articles were singled authored and 1984 articles were multiple-authored publications. The maximum degree of collaboration of articles was 0.99 in the year 2012, 2015, 2018 followed by 0.98 in year 2007 and 2017. The minimum degree of collaboration was 0.38 in the year 1990 followed by 0.50 in the year 1989. It remained constant 0.95 in the years 2008, 2009, 2010 and 2013. In 1998, 2006, 2017 it remained constant with 0.96. In 1983 Subramanian developed the mathematical formula of DC which is mentioned below-

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

Where Ns= Single authored publications

Nm= Multiple authored publications

Table 6
Degree of Collaboration

Year	Single	Multiple	DC
1989	7	7	0.50
1990	8	5	0.38
1991	5	6	0.55
1992	1	7	0.88
1993	2	24	0.92



1994	4	16	0.80
1995	3	20	0.87
1996	3	17	0.85
1997	3	19	0.86
1998	1	27	0.96
1999	1	32	0.97
2000	2	26	0.93
2001	2	24	0.92
2002	2	18	0.90
2003	2	33	0.94
2004	6	39	0.87
2005	1	34	0.97
2006	2	51	0.96
2007	1	57	0.98
2008	5	95	0.95
2009	3	60	0.95
2010	4	83	0.95
2011	3	90	0.97
2012	1	143	0.99
2013	8	151	0.95
2014	5	156	0.97
2015	2	173	0.99
2016	5	194	0.97
2017	3	193	0.98
2018	2	184	0.99
Total	97	1984	0.95

5.7 Author Productivity

Table 7 represents the author's productivity of articles published by faculty members of Gauhati University during the period of 1989-2018 and shows that the total average articles per author is 28.35 from 2081 articles with 651141 authors. The average publication per author is highest 60.9 in the year 1989. From the Table 7 it is also found that the average publication per author was found 0.0 in the year 2004 and 2016. In 2004, 2012, 2013, 2014, 2015, 2016, 2017, 2018 the average publication per author was lower than the previous year. In the year 2013, 2014, 2015, 2016, 2017 and 2018 average publication per author was lower than other years.

Table 7
Author Productivity

Year	Article	Author	Average publication per author
1989	14	23	60.9
1990	13	31	41.9
1991	11	20	55.0
1992	8	17	47.1
1993	26	71	36.6
1994	20	51	39.2
1995	23	57	40.4
1996	20	48	41.7
1997	22	48	45.8
1998	28	74	37.8
1999	33	93	35.5
2000	28	73	38.4
2001	26	82	31.7
2002	20	46	43.5
2003	35	106	33.0
2004	45	90180	0.0
2005	35	125	28.0
2006	53	183	29.0
2007	58	204	28.4
2008	100	310	32.3
2009	63	214	29.4
2010	87	276	31.5
2011	93	302	30.8
2012	144	1511	9.5
2013	159	49350	0.3
2014	161	19540	0.8
2015	175	25415	0.7
2016	199	401184	0.0
2017	196	31321	0.6
2018	186	30186	0.6
Total	2081	651141	850.5

5.8 Source Title

Table 8 represents the name of the top ten source journals in where articles were published. Out of 2081 articles, 415(19.94%) were published in the top ten source journals. The highest 68(16.4%) numbers of articles were from the Indian Journal of physics. Physics Letters stood second rank with 54(13.0%) articles. The lowest 31(7.5%) articles were published from Pramana: Journal of Physics. Physical review published 42(10.1%) articles, Indian Journal of Chemistry Section B-Organic Chemistry Including Medicinal Chemistry published 41(9.9%), 39(9.4%) articles were collected from Current Science, 38(9.2%) articles were published from Indian Journal of Pure & Applied Physics 36(8.7%) articles were from Chemistry Section A-Inorganic Bio-Inorganic Physical Theoretical & Analytical Chemistry. European Physical Journal and Journal of High Energy Physics contain 34(8.7%) & (7.7%) articles respectively.

Table 8

Top Ten Source Titles

S.No.	Source title	No. of Articles	Percentage
1	Indian Journal of physics	68	16.4
2	Physics Letters	54	13.0
3	Physical Review	42	10.1
4	Indian Journal of Chemistry Section b-organic Chemistry Including Medicinal Chemistry	41	9.9
5	Current Science	39	9.4
6	Indian Journal of Pure & Applied Physics	38	9.2
7	Indian Journal of Chemistry Section A-Inorganic Bio-Inorganic Physical Theoretical & Analytical Chemistry	36	8.7
8	European Physical Journal	34	8.2
9	Journal of High Energy Physics	32	7.7
10	Pramana-Journal of Physics	31	7.5
Total		415	100.0

5.9. Funding Agencies

Table 9 shows that out of a total of 2081 articles, 830 (39.88%) articles were published by the top 10 funding agencies. The highest 280 (33.7%) number of articles were published which were funded by the Department of Science & Technology followed by 209 (25.2%) by the University



Grants Commission. The lowest 11(1.3%) number of articles were published with the funding of A.I. Alikhanyan National Science Laboratory (Yerevan Physics Institute) Foundation (ANSL) while the Indian Council of Medical Research funded only 19(2.3%) articles during the period.

Table-9
Funding Agencies

Sl. No.	Funding Agencies	Articles	Percentage
1	Department of Science and Technology (DST)	280	33.7
2	University Grants Commission	209	25.2
3	Department Of Biotechnology (DBT)	96	11.6
4	Council of Scientific and Industrial Research (CSIR)	61	7.3
5	Worldwide LHC Computing Grid (WLCG)	50	6.0
6	Grid Centres; Worldwide LHC Computing Grid (WLCG)	45	5.4
7	State Committee of Science; World Federation of Scientists (WFS)	30	3.6
8	Science and Engineering Research Board	29	3.5
9	Indian Council of Medical Research	19	2.3
10	A.I. Alikhanyan National Science Laboratory (Yerevan Physics Institute) Foundation (ANSL)	11	1.3
Total-		830	100.0

6. Major findings

After analysis of the collected data, the following major findings are revealed-

1. During the study period (1989-2018), 2081 articles were published from Gauhati University Faculty members where the highest maximum number of 199(9.56%) articles was published in 2016 and the lowest 8(0.38%) articles were published the year 1992. A remarkable growth was found in the year of 2008, which was 100 numbers of publications.
2. It is observed from the analysis that, in 2016 the highest Annual Growth Rate was 19800 followed by 19500 in the year 2016. The lowest AGR rate was 700 in the year of 1992. AGR was significantly increased in 2008 to 9990 where 5700 was in 2007.
3. No specific stable growth was every year during the period of study. The Compound Annual Growth Rate was negative in the year of 1990(-0.036), 1991(-0.080), 1992(-0.147), 1994(-0.123), 1996(-0.067), 2000(-0.079), 2001(-0.036), 2002(-0.123), 2005(-0.118), 2009(-0.206), 2017(-0.008), 2018(-0.026).
4. In the year of 2002, the maximum Relative Growth Rate 2.68 was found and the lowest RGR was 0.73 in the year 1990. Data analysis shows that RGR was continuously increased from 1993 to 1997 (1.02-1.97). In 1998, it was decreased to 1.89. In 1998 and 1999, it remained constant (1.89).



5. The maximum Doubling Time was 0.95 in the year of 1990. In the year 2002, it was a minimum of 0.26. It is observed there was a continuous decrease from 1993 to 1997 (0.68-0.35). It remained constant (0.37) in 1998, 1999 & 2015, 2016 with 0.32 DT.
6. Study shows that Faculty members of Gauhati University had more interest in two authored contributions. Highest 683 (32.82%) articles were contributed by two authored followed by more than four authored articles 543(26.09%). The lowest 97(4.66%) number of articles were contributed by single-authored.
7. The highest degree of collaboration of articles was 0.99 while the minimum degree of collaboration was 0.38 in the year 1990. In the years 2008, 2009, 2010 and 2013 it remained constant with 0.95 while in 1998, 2006, and 2017 it remained at 0.96.
8. The total 415(19.94%) articles were published in the top ten source journals among those 2081 articles. Indian Journal of physics published the highest 68(16.4%) numbers of articles. The lowest 31(7.5%) articles were published from Pramana: Journal of Physics.

7. Conclusion

A study on research publication of the academic community mainly helps to measure the growth pattern of their publications. Though various studies were conducted to analyze the publications of any institution or journal the period of those studies was a maximum of 10 years. But this study analyses the publications of faculty members of Gauhati University from 1889 to 2018 i.e. 30 years. As the study shows that there was no stable growth of publication every year, so variation is shown in AGR, CAGR, RGR, DT also. The faculty members of Gauhati University have been continuing their research work and different funding agencies help to continue their research work.

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