

## Research Productivity of Central Universities in Northeast India with Special Reference to Web of Science

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### Abstract

*The current study attempts to evaluate the research productivity of central universities in Northeastern states of India on the basis of research publications indexed by Web of Science database during the period from 2010 to 2020. The retrieved data has been analyzed on the following parameters such as year wise distribution of research publications, citations, h-indexes, funding sources, research areas and preferred sources for research publication. The result of the study shows that Tezpur University have published the highest number of research publications and gaining highest number of citations that helped to gain highest number of h-index values during the selected time period. Nine central universities of Northeast states have tried to improve their research publications. Here, it is seen that Tezpur University is the most dynamic university in the entire northeastern region. Again, the study investigate that, majority of central universities in Northeast India have published highest research papers in the most prolific journals "Current Science". The current study recommends that National Sports University and Central Agriculture University should improve their research publications to get more visibility among the scientific community. Both of the universities should publish their research publications in reputed and high impact journals.*

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**Keywords:** Research productivity, Research output, Northeastern University, Research, Central university, Tezpur University, Research publication, Citation, h-index.

### 1. Introduction

Research is required in building and improving innovative thoughts and supporting to existing knowledge. It leads to development of our society. Our higher education systems are an important sector for teaching and learning, conducting experimental research, developing new program, new theory and new knowledge for our society. Research productivity is one of the major measures of universities to identify the academic performance and an essential indicator for calculations the rankings of all universities. Ranking of a university or an institution is based on their quality and quantity of their publishing research output. Now, the internet world is flooded with thousands of research papers by thousands of authors. So that Web of Science database is indexed high quality journals where to authors are published their scholarly and quality articles that gives visibility to their hard works as well as increases their rankings with the institute in universal platform. High quality research output is very important for a university or an institute. Research productivity helps to ranking of a university or an institute. It also helps to create knowledge and sharing through its several forms of teaching, research and outreach activities.

## Central Universities in Northeastern States of India:

There are 54 central universities in India, out of which 11 central universities come under in Northeastern region of India. The list of central universities in Northeastern states of India is shown in Table 1. The Central Agricultural University and National Sports University, Manipur have not been included in the study as they do not have their research publications in the Web of Science database.

**Table - 1: List of Central Universities in Northeastern states of India**

S. No.	Name of the University	Year of Establishment	State
1	Assam University	1994	Assam
2	Central Agriculture University	1993	Manipur
3	Manipur University	1980	Manipur
4	Mizoram University	2001	Mizoram
5	Nagaland University	1994	Nagaland
6	National Sports University	2018	Manipur
7	North Eastern Hill University	1973	Meghlaya
8	Rajiv Gandhi University	1984	Arunachal Pradesh
9	Sikkim University	2006	Sikkim
10	Tezpur University	1994	Assam
11	Tripura University	1987	Tripura

## 2. Literature review

Erfanmanesh, Didegahand and Omidvar (2010) conducted a study to examine the visibility and impact of library and information science researchers of their research publications. The study covered total number 99,789 of documents published in 61 library and information science journals and the data were extracted from Web of Science database during 1998 to 2007. The study found that highest percentage of all citations to LIS publications were made by USA researchers and computer science researches had frequently cited LIS publication in their research.

Okiki (2013) highlighted a study on the research productivity of faculty members in Nigerian Federal University. The researcher concluded that the research productivity of faculty members was high in the publishing of conference research papers, journal research articles, technical reports etc. On the other hand, research productivity of faculty members was lower in the publishing of monographs, book chapters, textbooks and patents etc.

Basavaraja (2018) carried out a study to examine the total number of citations, h-index, average citation per article of the faculty members of University of Mysore and Bangalore University from 1989 to 2018. The study found that faculty members of the both universities must to publish their research papers in various peer reviewed journals with high impact factor.

Jeyapragash and Rajkumar (2019) investigated the memberships and research contributions of IITs in ResearchGate. The data were taken out from ResearchGate website. The study found that total 18 numbers of IITs had shared their research publications through ResearchGate. The study also examined that IIT Bombay had more members and IIT Palakkad had very less members in ResearchGate.

Veer and Kulkarni (2020) examined total numbers of 8069 research papers with 73839 citations of Indian Institute of Technology, Bombay analysed during 2015 to 2019. The study concluded that faculties of IITB contributed more numbers of research articles in the reputed and high impact factor journals. The IITB faculty members also collaborated research papers with the several international institutes.

Pandya, Joorel and Solanki (2021) conducted a study to investigate the research output of newly established central universities in India. The study examined total numbers of 3927 research papers were taken out from Scopus database. The study concluded that Central University of Rajasthan had published highest number of research publications and the highest publications research area was in Chemistry.

### **3. Objectives of the study**

- To find out the year wise research output of Northeastern states in India universities.
- To measure the citation growth of selected universities.
- To find out the h-index distribution of Northeast India universities during the last eleven years.
- To identify the research areas under which the most number of research articles are published from Northeastern states in India universities.
- To identify the highest funding agency and the highest open access publications during the last eleven years of Northeastern states in India universities.

### **4. Methodology**

The scope of the study is confined only the research publications in web of science indexed journals, books or conferences of nine central universities situated in Northeastern states of India. The Central Agricultural University and National Sports University, Manipur have not been included in the study as they do not have their research publications in the Web of Science database. The data of the research publications, citations and h - indexes for the eleven years period from 2010 to 2020 are extracted from Web of Science database till 1st July, 2021.

### **5. Data analysis**

#### **Year wise research output of Central Universities in Northeastern states of India**

Research productivity of the Northeast India universities evaluates on the basis of their year wise research publications available in Web of Science database from 2010 to 2020. Table 2 represents year wise research productivity of central universities in Northeastern states of India. Here, it is seen that Tezpur University have published highest research publication during the selected period with 2898 number of publications. It is followed by North Eastern Hill University, Assam University and Mizoram University in which 1658, 1415 and 798 research papers have published respectively. On the other hand, Tripura University and Manipur University have published with 628 and 627 numbers of publications. Similarly, Sikkim University and Rajiv Gandhi University in which 309 and 257 research papers have published. It is further found that, Nagaland University has published the least number of publications during the selected period with 180 numbers of publications.

**Table - 2: Year wise research output in Central Universities of Northeastern states of India**

S. N.	Name of the University	Publications											
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
1	Assam University	60	80	89	109	144	134	150	146	164	147	192	1415
2	Manipur University	59	53	68	65	69	47	44	62	43	56	61	627
3	Mizoram University	29	36	42	43	44	59	98	86	79	109	173	798
4	Nagaland University	11	11	19	14	15	10	09	25	17	29	20	180
5	North Eastern Hill University	93	105	125	154	131	143	145	164	192	200	206	1658
6	Rajiv Gandhi University	09	15	16	29	21	11	21	29	24	37	45	257
7	Sikkim University	04	07	10	08	05	22	29	39	45	62	78	309
8	Tezpur University	118	150	203	250	339	285	293	349	304	305	302	2898
9	Tripura University	28	34	26	45	51	45	58	85	66	90	100	628
Total		411	491	598	717	819	756	847	985	934	1035	1177	8770

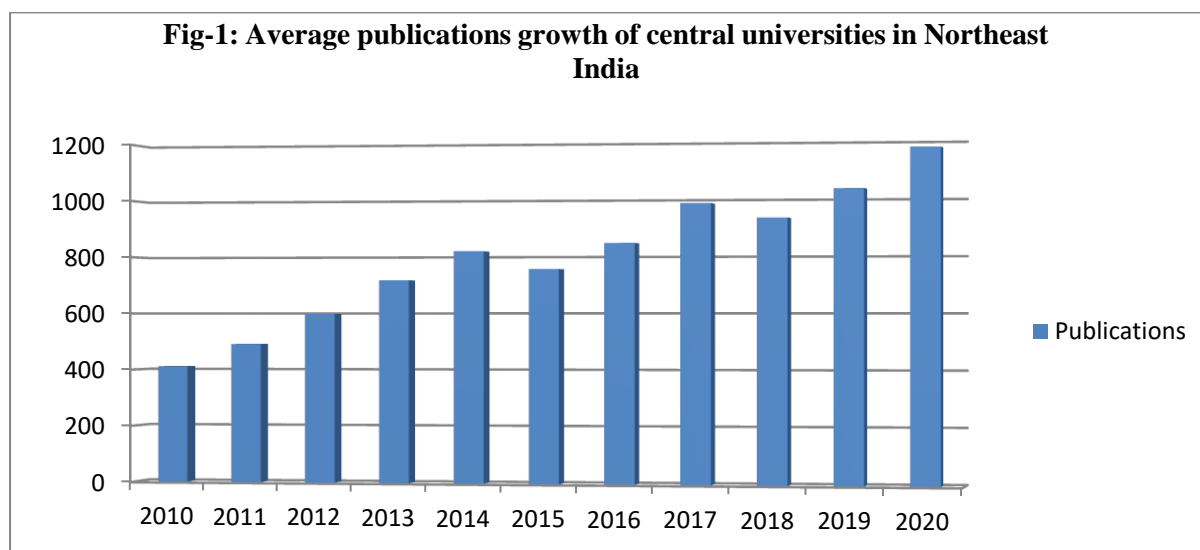
**Fig-1: Average publications growth of central universities in Northeast India****Average Citation per paper of Central Universities in Northeastern states of India**

Table 3 shows that average citation per paper of central universities in Northeastern states of India. Here, it is seen that Tezpur University have received highest citations for its published research papers with 15.56 citations per paper, similarly Sikkim University, Assam University, Mizoram University, Manipur University, Tripura University, North Eastern Hill University and Rajiv Gandhi University have received citations for their published research papers with 11.37, 10.52, 10.28, 8.92, 8.64, 8.46 and 7.84 per paper respectively. On the other hand, Nagaland University has received lowest citations with 6.53 per paper during the selected time period.

**Table - 3: Average Citation per paper**

S. N.	Name of the University	Average Citation per paper during 2010-2020	
		Citation	Average citations per item
1	Assam University	14,881	10.52
2	Manipur University	5590	8.92
3	Mizoram University	8204	10.28
4	Nagaland University	1175	6.53
5	North Eastern Hill University	14,023	8.46
6	Rajiv Gandhi University	2,015	7.84
7	Sikkim University	3512	11.37
8	Tezpur University	45,079	15.56
9	Tripura University	5424	8.64

**H-Index distribution of the Central Universities in Northeastern states of India**

From table 4 it is observed that, Tezpur University has received the highest h- index value of 75. Likewise, Assam University, North Eastern Hill University, Mizoram University, Manipur University, Tripura University, Sikkim University and Rajiv Gandhi University received h-index value of 46, 42, 39, 35, 29, 28 and 24 respectively. On the other hand, Nagaland University has lowest h- index value of 20.

**Table - 4: H-Index distribution**

S. N.	Name of the University	H- index
1	Assam University	46
2	Manipur University	35
3	Mizoram University	39
4	Nagaland University	20
5	North Eastern Hill University	42
6	Rajiv Gandhi University	24
7	Sikkim University	28
8	Tezpur University	75
9	Tripura University	29

**General information of research output from the Central Universities in Northeastern states of India**

Under the table 5, it is observed that Northeastern India five universities received the maximum research grant from Department of Science Technology, India on the other hand another Northeastern India four universities are received the maximum research grant from University Grants Commission, India. Most of the areas of research in the central universities of Northeastern states in India are related to science background subject. Seven universities of Northeastern states in India have the highest publications of research area is in “Chemistry”. On the other hand, another two universities Mizoram University and Rajiv Gandhi University have the highest publication of research area are in “Physics” and “Mathematics” subject. From the table 5, it is observed that five universities of Northeastern states in India have published highest research papers in the most prolific journals “Current Science”. On the other hand, Mizoram University and Manipur University have published highest research papers in the most prolific journals “Zootaxa”. Again, another two

universities North Eastern Hill University and Tezpur University have published highest research papers in the most prolific journals “Journal of Organometallic Chemistry” and “Rsc Advances”. Every institute should focus on publishing research papers on open access journals. Here, it is seen that Tezpur University have published highest research publication in open access with 394. It is followed by North Eastern Hill University, Assam University, Mizoram University, Manipur University, Sikkim University and Rajiv Gandhi University have published research publications in open access with 363, 332, 181, 102, 96 and 61 respectively. On the other hand, Nagaland University has published lowest publication in open access with 38.

**Table - 5: General information of research output**

<b>S. N.</b>	<b>Name of the University</b>	<b>Highest funding Agency</b>	<b>Top Research area</b>	<b>Maximum published Journal</b>	<b>Highest open access publications</b>
1	Assam University	University Grants Commission, India (223)	Chemistry (281)	Current Science (38)	332
2	Manipur University	University Grants Commission, India (103)	Chemistry (161)	Zootaxa (28)	102
3	Mizoram University	Department of Science Tech., India (110)	Physics (135)	Zootaxa (24)	181
4	Nagaland University	Department of Science Tech., India (19)	Chemistry (35)	Current Science (9)	38
5	North Eastern Hill University	University Grants Commission, India (462)	Chemistry (596)	Journal Of Organometallic Chemistry (39)	363
6	Rajiv Gandhi University	University Grants Commission, India (35)	Mathematics (51)	Current Science (13)	61
7	Sikkim University	Department of Science Tech., India (49)	Chemistry (60)	Current Science (13)	96
8	Tezpur University	Department of Science Tech., India (547)	Chemistry (888)	Rsc Advances (72)	394
9	Tripura University	Department of Science Tech., India (147)	Chemistry (173)	Current Science (18)	110

## 6. Major Findings of the Study:

- From Table 2, it is seen that Tezpur University has published highest research publications during the selected period with 2898 number of publications. On the other hand, Nagaland University has published the least number of research publications during the selected period with 180 numbers of publications.

- Table 3 shows that average citation per paper of central universities in Northeastern states of India. Here, Tezpur University has received highest citations for its published research papers with 15.56 citations per paper. On the other hand, Nagaland University has received lowest citations with 6.53 per paper during the selected time period.
- From Table 4, it is observed that, Tezpur University has received the highest h- index value of 75. On the other hand, Nagaland University has lowest h- index value of 20.
- Under Table 5, it is seen that, Northeastern India five universities received the maximum research grant from Department of Science Technology, India. And five universities of Northeastern states in India have published highest research papers in the most prolific journals “Current Science”.
- From Table 5, it is observed that, most of the areas of research in the central universities of Northeastern states in India are related to science background subject. Seven universities of Northeastern states in India have the highest publications of research area is in “Chemistry”. And, Tezpur University has published highest research publication in open access with 394. On the other hand, Nagaland University has published lowest publication in open access with 38.

## 7. Conclusion

The study exposed the current growth of research publications in the central universities of Northeast India. The Northeast India universities of research publications have increased during the selected time period. The result of the study found that Tezpur University have published the highest number of research publications during the selected period and gaining highest number of citations that helped to gain highest number of h- index values of 75. The study identified that Northeast India five universities have received maximum research grant from Department of Science Technology, India and another four universities of Northeast India have received maximum research grant from University Grants Commission, India. It is observed that, majority of central universities in Northeast India have published highest research papers in the most prolific journals “Current Science”. Again, investigation of research areas of the published research papers from the universities revealed as “Chemistry” is the most productive research area. The study also observed that, Tezpur University has published the highest research publication in open access journals with 394. All the nine universities of Northeast India have tried to improve their research publications. Here, it is seen that Tezpur University is the most dynamic university in the entire north eastern region. The study identified that nine central universities of Northeastern States in India have published their research papers in highly reputed and high impact factor journals. The study recommends that National Sports University and Central Agriculture University should improve their research publications to get more visibility among the scientific community. Both of the universities should publish their research publications in reputed and high impact journals. The quality research papers help to gain more citations and h- index values. It also helps to the universities to improve their rankings in global platform.

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