

## **Relationship between length of service of faculty member and research output**

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### **Abstract**

The relationship between the length of service of a faculty member and their research output can vary. Generally, faculty with more years of service might have accumulated more experience and resources, potentially leading to increased research productivity. However, other factors such as personal motivation, funding availability, and changes in research interests also play a significant role in determining research output. The background of the study, including the specific field and research focus, can influence this relationship as well. Keep in mind that individual variations exist and not all faculty members follow the same trajectory in terms of research productivity over their years of service.

Faculty members at universities often have three primary responsibilities: instructing students, doing research, and managing the institution. Professors should ideally have considerable leeway in deciding how to divide their time among the three responsibilities, but the reality is different.

### **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.

In the realm of higher education, the dual role of faculty members as educators and researchers is paramount. The scholarly contributions of faculty, expressed through research output, not only advance the frontiers of knowledge but also play a pivotal role in shaping the reputation and impact of academic institutions. It is widely acknowledged that the productivity of faculty members in terms of research output is a key indicator of the vitality and competitiveness of an academic institution. This study embarks on an exploration of a crucial aspect of academic life, delving into the intricate relationship between the length of service of faculty members and their research productivity.

Academic institutions worldwide have long been invested in deciphering the factors that influence the research output of their faculty. While factors such as research funding, access to resources, and institutional support have been extensively studied, the influence of an individual's length of service within the academic community on their research productivity remains a topic of enduring interest and debate.

The impetus for investigating this relationship arises from the recognition that faculty members undergo a dynamic and evolving journey in academia. As they progress through their careers, they accrue knowledge, experience, and networks that can potentially affect their research productivity. The foundational years of a faculty member's career may be characterized by an intense focus on establishing themselves, while those with more extensive service may have deeper institutional knowledge, mentoring roles, and potentially broader access to research opportunities.

To date, research on the relationship between length of service and research output has yielded a spectrum of findings, ranging from positive correlations to nuanced dependencies on specific disciplines and institutional contexts. The intricacies of this relationship have significant implications for academic institutions in terms of faculty development, resource allocation, and strategic planning.

This study aims to contribute to the ongoing discourse by conducting a systematic investigation into the interplay between length of service and research output within the context of faculty members in departments of Information Technology, Computer Science, and Computer Science and Engineering

within Central Universities in North East India. By scrutinizing this specific academic domain, we aspire to offer insights that are not only academically relevant but also geographically contextualized, thereby enriching the broader body of knowledge in this field.

In the following sections, this research paper has elucidated the objectives, methodology, and major findings of our study. Through rigorous analysis, we endeavor to shed light on whether there exists a discernible relationship between faculty members' length of service and their research output, and how this relationship may inform academic institutions in fostering a thriving research ecosystem.

### **Literature Review**

**Perez et al., (2022)** One of the primary goals of a university is to further knowledge, hence it is important that research be supported and encouraged. A teacher's capacity to undertake research is useful for tackling urgent social concerns from the classroom outward. Using Bandura's theory of learned helplessness as a foundation, this study evaluated the research abilities of professors at Cebu Technological University (CTU)-Moalboal Campus. According to the published works, no research has been conducted on the research skills of higher education faculty in the Visayas region of the Philippines, of which Cebu is a part. This encouraged the researchers to develop a validated instrument to collect data on the demographics of the lecturers and their research skills (2.89). Seventy-nine percent of the teaching staff took part in the survey. Using a descriptive-correlational study, the researchers found a statistically significant correlation between the dependent and independent variables. At the 0.05 level of significance, the findings showed that age (0.13), gender (0.56), and the number of articles written but not published (0.59) were not significant. There was a significant relationship between the number of years at the company (0.04), the number of years spent doing research (0.00), the number of papers published (0.00), and the number of conferences both domestic and foreign that were attended (0.02). Based on the study's results, a research management strategy was developed to help researchers overcome their most pressing obstacles. This improves the university's research culture by aiding and guiding college professors through the process of writing and publishing a research paper.

**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.

**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.

**Siwach (2019)** disparities in e-resource usage, techniques, purposes, barriers, and search tactics between faculty and research researchers are explored. The research was carried out via a survey technique at five North Indian institutions. The samples were chosen using stratified random sampling, and the final data set included responses from 668 participants, comprising 252 faculty members and 416 research researchers. The hypothesis testing was done using the Mann Whitney test. The survey indicated that professors were heavier users of electronic resources than graduate students. The usage, techniques, and goals of e-resources varied significantly. When compared to faculty members, research researchers had a harder time navigating e-resource. Faculty members significantly outperformed research scholars in the use of advanced search tactics, such as the usage of keywords, Boolean operators (AND OR NOT), phrase search, and wildcards. Library workers and policymakers may use the study's findings to improve library services, especially those related to electronic resources. The current study is novel since it examines the faculty and researchers independently, while earlier research has grouped them together. The purpose of this research is to compare and contrast teacher and researcher e-resource utilization and related factors.

**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.

**Delello et al., (2018)** In this post, we'll go over the most important takeaways from a case study that used a combination of qualitative and quantitative approaches to examine the range of professional activities undertaken by university teachers at one Texas regional institution that is shifting its emphasis to research. Despite what has been reported in the media, it has been determined that full-time faculty members at all levels work more hours per week than the national average, with the majority of those hours (67%) being spent on instructional activities. The authors warn individuals advocating for sweeping changes in higher education to stop spreading falsehoods about the responsibilities played by academics in the institution, and they encourage administrators to include expert input.

**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.

**Fawzi & Al-Hattami (2017)** While the University of Bahrain's Bahrain Teachers College is widely regarded as one of the most promising educational institutions in the area, this study underlines the problems that faculty members encounter and which limit them from conducting scientific research articles. The results of a survey sent to all faculty members across all departments. The sample included 28 professors from a variety of departments and levels. Faculty members were found to have the requisite skills to conduct and publish original research. However, they requested more time, which they expect to be available if the teaching load is lightened.

Faculty personnel at higher education institutions are tasked with a variety of service tasks for their institutions, professional societies, and external communities, as noted by Mamiseishvili et al., (2016). However, this duty is seldom rewarded in the workplace and is hardly considered when deciding who gets promoted. We surveyed 4,400 professors from different academic ranks at different research universities to learn more about their experiences with service. The results indicated that mid-career faculty members at the associate professor position were much less happy with their service duties than were either assistant or full professors. These service functions include workload, equity, work balance, recognition, and institutional support.

Academics' views on information resource availability for research productivity were studied by Okiki et al. (2013) at federal institutions in Nigeria. The researchers opted for a descriptive survey approach. One thousand fifty-seven faculty members from twelve federal institutions throughout Nigeria's six geo-political zones were selected using the Multistage sampling method. The research included all levels of faculty and graduate students working in academia. These methods and tools were used to acquire data: There is a strong correlation between academic research output and information resource accessibility ( $r=0.69$ ). Eight hundred seventy-three total questionnaires were analyzed. Descriptive statistics, namely the Pearson Product Moment Correlation Coefficient, were used to examine the data. There was no correlation between library holdings and the number of scholarly articles published. With a mean score of 2.41 (SD = 0.90), the libraries of Nigeria's federal institutions have more than enough information resources for their faculty to be productive in their research. Librarians should arrange an ongoing awareness effort on the availability of information resources to boost academics' research productivity.

Okiki (2013) drew attention to a study examining the academic output of academics at Nigeria's Federal University. The study's author found that faculty members produce a large number of scholarly works (such as conference papers, journal articles, technical reports, etc.). However, faculty members' research production was lower when measured by the number of scholarly works (such as monographs, book chapters, textbooks, patents, etc.) published.

Tang et al. (2003) studied 233 professors from six regional state universities in Tennessee to determine the impact of rank, tenure, duration of service, and institution on faculty members' perspectives on research and teaching. Unlike rank and tenure, the duration of service had a substantial impact on faculty members' views on research orientation and the impact of awards on teaching. Those with 20+ years of experience were least interested in doing research, while those with academic positions lower than full professor were most certain that financial incentives affect

classroom performance. In the context of teacher training, mentorship, and socialization, the authors explore these and other findings.

Biglan et al. (1973) studied the academic community and its output in terms of the characteristics of the disciplines involved. Based on an earlier multidimensional analysis by A. Biglan, subfields of study were grouped according to their focus on either a single paradigm (hard or soft), pure or applied applications, or life systems (life system or nonlife system). Ss were found to vary in their social network size, the number of journal articles, monographs, and technical reports they authored, the number of dissertations they sponsored, and other metrics according to the demographics of their region.

**Objectives**

- 1) To study the relationship between length of service of faculty member and research output

**Methodology and Research Design**

Central universities in northeast India are the focus of this research, namely the departments of Information Technology, Computer Science, and Computer Science and Engineering. Here, we'd make an attempt to investigate every nuance of the citations and extrapolate broad conclusions based on the available facts. Information technology, computer science, and computer and information engineering programs at 14 different universities will provide the data. These departments have more than 95 teachers. All the papers written by professors will be gathered together for this research.

For this study the sample size will be the publications which are given in the existing profile of faculty members in the respective websites along with annual report of each university which amounts to more than 500. Collected data will be analyzed systematically and interpreted by using proper statistical package such as SPSS. The scholar will adopt the following methods for the study.

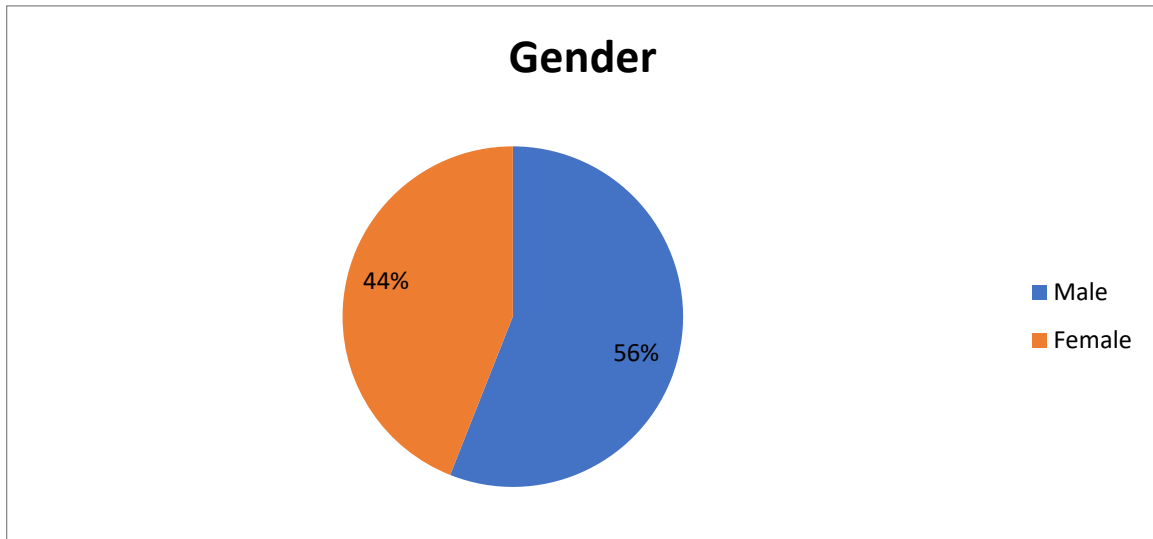
**Data collection and Analysis:**A set of questions related to the research topic were developed and field-tested in a structured questionnaire. The faculty members in each department at the several institutions in the north east and central regions of the country were sent the questionnaire. Statistical programs like SPSS were used to decipher and tabulate the data before it was evaluated.

**Data Analysis**

Research productivity of the Northeast India universities evaluates on the basis of their yearwise research publications from 2010 to 2020. Here, it is seen that a total of 8770 research papers have been published by the universities of Northeast India. The following table evaluates the demographic distribution and related findings to assess the aim of the study. In order to assess the aim, the required data was collected from study subjects using a questionnaire. The analysis of the collected data is presented her in the form of tables and graph.

**Table: Genderwise distribution of the subjects**

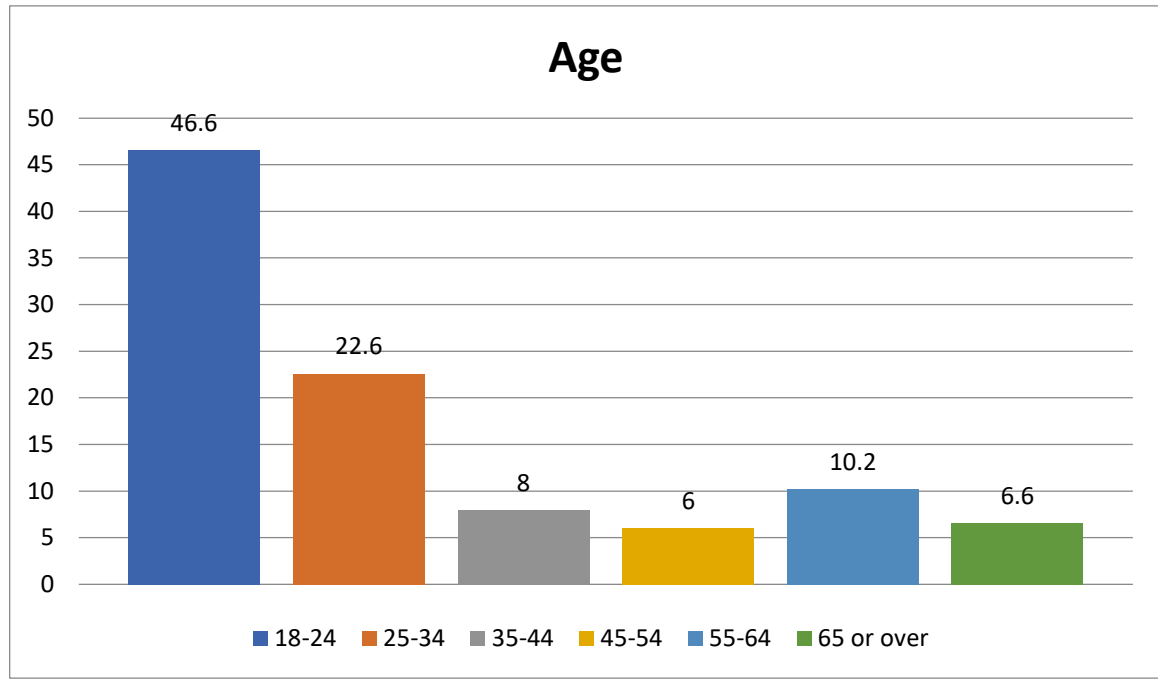
<b>Gender</b>		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	280	56.0	56.0	56.0
	Female	220	44.0	44.0	100.0
	Total	500	100.0	100.0	



The gender wise distribution of the study subjects has signified that majority of the study subjects were male. Among the respondents, 280 individuals, or 56.0% of the total sample, identified as male. The remaining 220 respondents, constituting 44.0% of the total sample, identified as female. This suggests that a significant portion of the participants are female. Overall, the gender distribution in the study reflects a slight gender imbalance, with a higher representation of males compared to females.

**Table: Age distribution of the subjects**

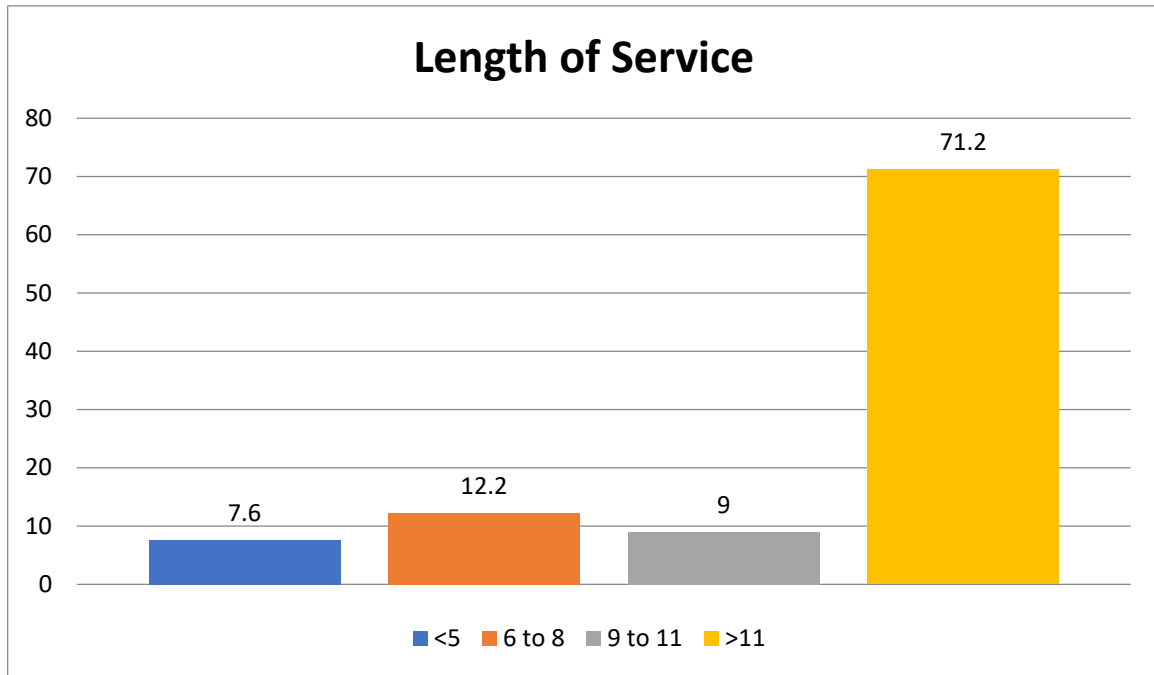
<b>2. Age (Years)</b>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-24	233	46.6	46.6	46.6
	25-34	113	22.6	22.6	69.2
	35-44	40	8.0	8.0	77.2
	45-54	30	6.0	6.0	83.2
	55-64	51	10.2	10.2	93.4
	65 or over	33	6.6	6.6	100.0
	Total	500	100.0	100.0	



In our study the age wise distribution of the study subjects has signified that majority of the study subjects belongs to 18-24 years age group, accounting for 46.6% of the total sample. This suggests that a significant portion of the participants are in the early stages of adulthood and likely encompass undergraduate and early graduate students. The 25-34 age group constitutes the second-largest segment of respondents, representing 22.6% of the total sample. Following these groups, there is a gradual decline in the frequency of respondents with increasing age. The 35-44 age group comprises 8.0% of the sample, the 45-54 age group represents 6.0%, and the 55-64 age group constitutes 10.2% of the total. Lastly, the "65 or over" category accounts for 6.6% of the respondents, indicating a presence of experienced individuals in the senior age group within the sample. In summary, the age distribution in this study is quite diverse, encompassing a wide range of age groups.

**Table: Length of service**

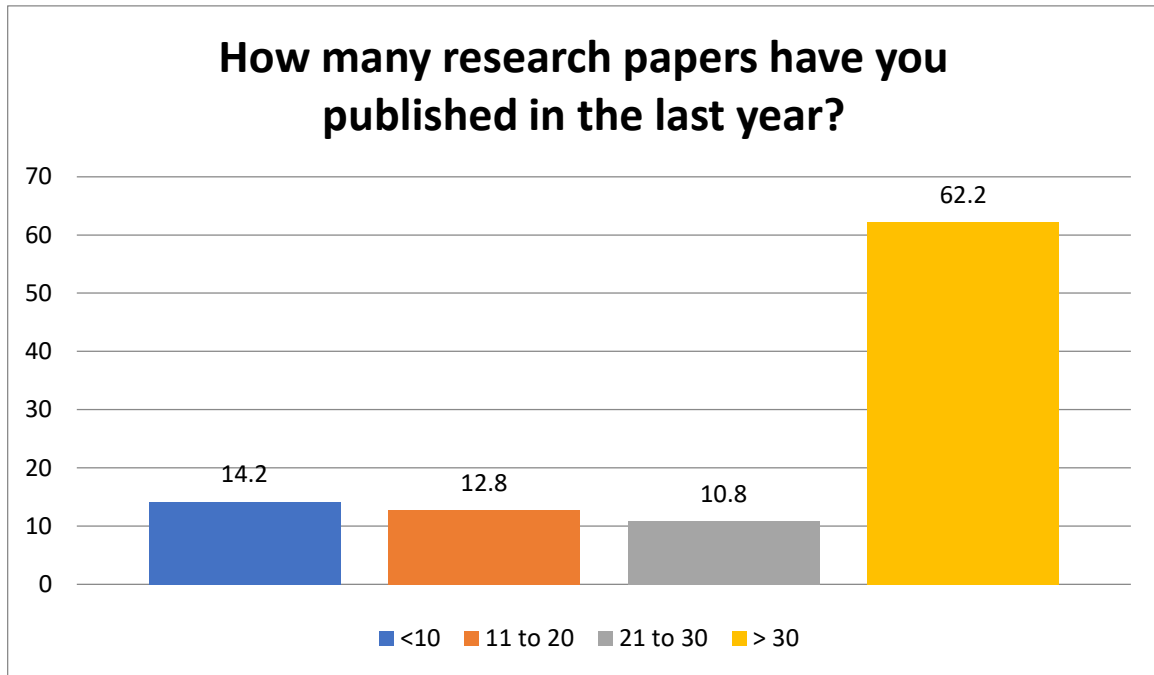
Length of service		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<5	38	7.6	7.6	7.6
	6 to 8	61	12.2	12.2	19.8
	9 to 11	45	9.0	9.0	28.8
	>11	356	71.2	71.2	100.0
	Total	500	100.0	100.0	



The data presented in the table provides insight into the distribution of respondents' length of service in their respective academic positions. The majority of respondents, comprising 356 individuals (71.2% of the total sample), have served in their academic positions for more than 11 years followed by 12.2% subjects with a length of service 6-8 years. This group represents a significant portion of experienced faculty members who have accumulated a substantial amount of time in their roles, likely holding senior positions within their respective institutions. The study found out that there were 7.6% subjects with a length of service less than five years. There are 45 respondents (9.0% of the total) with a length of service 9 to 11 years.

**Table: Research papers published by study subjects**

How many research papers have you published?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<10	71	14.2	14.2	14.2
	11 to 20	64	12.8	12.8	27.0
	21 to 30	54	10.8	10.8	37.8
	> 30	311	62.2	62.2	100.0
	Total	500	100.0	100.0	



The data presented in the above table represents the number of research papers published by the 500 respondents participating in this study. The findings reveal a wide spectrum of research productivity among the respondents. A notable portion of respondents, specifically 71 individuals (14.2% of the total sample), have published less than 10 research papers. This group likely includes individuals who are in the early stages of their research careers or have focused on other professional responsibilities. There were 64 respondents (12.8% of the total) who have published 11 to 20 research papers. This group represents individuals who have demonstrated moderate research productivity, indicating a commitment to scholarly work. The study found out that 54 respondents (10.8% of the total) have published 21 to 30 research papers, indicating a substantial level of research output. These individuals have demonstrated a significant dedication to research activities. Remarkably, the majority of respondents, accounting for 311 individuals (62.2% of the total), have published more than 30 research papers. This group represents highly prolific researchers who have made a substantial contribution to their respective fields.

In summary, the data underscores the diversity in research productivity among the faculty members, ranging from those with minimal publication records to highly prolific researchers with a substantial body of work. This information provides valuable insights into the research output of the study's participants and may contribute to a comprehensive analysis of factors influencing research productivity.

**Hypothesis:**

H1: Research output is directly proportional to the length of service of the faculty members.

H0: Research output is not directly proportional to the length of service of the faculty members.

Correlations		
	2.How long have you been associated with this department?	6.How many refereed research papers have you published in the last year?



How long have you been associated with this department?	Pearson Correlation	1	.027
	Sig. (2-tailed)		.042
	N	500	500
How many research papers have you published?	Pearson Correlation	.027	1
	Sig. (2-tailed)	.042	
	N	500	500

The presented analysis examines the relationship between the length of service of faculty members in a specific department and their research productivity.

The correlation analysis reveals a very weak positive correlation with a coefficient of approximately 0.027. This suggests that there is a slight tendency for research productivity to increase as the length of service within the department increases.

The significance level (p-value) of 0.042 suggests that the observed correlation is statistically significant at the 0.05 significance level (assuming a two-tailed test). Therefore, the findings do support that Hypothesis H1, which proposed a direct proportional relationship between length of service and research output. In summary, the data suggests that there is a statistically significant but weak positive correlation between length of service and research productivity.

### Major Findings

The major findings of our study are as follows:

- Over the period of 2010 to 2020, the prescribed departments of universities in Northeast India collectively published 8,770 research papers, reflecting a significant research output.
- Data for the study was collected through a questionnaire administered to the study subjects, facilitating the assessment of research productivity.
- The study found that the majority of the study subjects were male, constituting 56.0% of the total sample, while females accounted for 44.0%. This indicates a gender imbalance in the study, with more male participants.
- The age distribution of the study subjects revealed that 46.6% belonged to the 18-24 years age group, indicating a significant presence of undergraduate and early graduate students. The 25-34 age group represented 22.6% of the total sample, showcasing a diverse range of age groups.
- The majority of faculty members, comprising 71.2% of the total sample, had served in their academic positions for more than 11 years. This suggests a significant proportion of experienced faculty members holding senior positions within their institutions.
- On the other hand, 7.6% of the respondents had less than five years of service, indicating the presence of early-career faculty members in the sample.
- A noteworthy finding is that 12.8% of respondents had published 11 to 20 research papers, demonstrating moderate research productivity, likely indicating a commitment to scholarly work.
- The study found out that 10.8% of respondents had published 21 to 30 research papers, indicating a substantial level of research output and dedication to research activities.
- The majority of respondents, accounting for 62.2% of the total, had published more than 30 research papers, categorizing them as highly prolific researchers who made substantial contributions to their respective fields.
- The study found a statistically significant correlation ( $p = 0.042$ ) between faculty members' length of service and their research productivity in the department.
- In summary, the study revealed a wide range of research productivity among faculty members, spanning from those with minimal publication records to highly prolific researchers. These findings shed light on the diversity of research output among faculty members in Northeast India universities, with various factors likely influencing their productivity levels.

### Conclusion

This research paper investigated the relationship between the length of service of faculty members and their research output in Northeast India universities. The study spanned the years 2010 to 2020 and included the analysis of 8,770 research papers published by these universities during this period. Data were collected through questionnaires to assess research productivity among faculty members. The study found out that majority of respondents (62.2%) had published more than 30 research papers, signifying highly prolific researchers making substantial contributions to their respective fields.

In conclusion, this study unveiled a wide spectrum of research productivity among faculty members in Northeast India universities. While some exhibited minimal publication records, others were highly prolific researchers. The research output was influenced by various factors, with the length of service showing a weak but statistically significant positive correlation with research productivity. However, this relationship's practical significance was limited, emphasizing the importance of considering multiple factors in understanding and enhancing research productivity. These findings contribute to a more comprehensive view of faculty members' research output in the context of Northeast India universities. These findings also underscore the need for a holistic approach to understanding and enhancing research productivity among faculty members, taking into account various contributing factors beyond seniority.

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