

Research Performance of Universities in West Bengal: A Comprehensive Metric Study

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Submitted by

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Study titled as '*Research Performance of Universities in West Bengal: A Comprehensive Metric Study.*' The study is designed in five main chapters to fulfil its entire objectives. These chapters are as follows –

Chapter-I, 'Introduction' focuses different aspects of higher education system in India as well as in the state of West Bengal. This chapter also describes the profiles of the universities under investigation.

Chapter-II, in the second chapter of the study i.e. 'Literature Review', where the previous works related to measuring research performance on three different point of view has been highlighted.

Chapter-III, the third chapter titled as 'Research Design' describes the statement of the problem, research questions and objectives of the study and the main part which deals with methodology of the study has been described in detail.

Chapter-IV, this is the main chapter of the study, 'Data Analysis and Interpretation', where all the parameters according to the objectives has been described and interpreted with the help of metrics-based indicators and statistical methods.

Chapter-V, the last chapter, 'Findings and Conclusion' gives a brief note of the findings as per the objectives set for the research questions arises. The chapter also gives the suggestions and conclusions at the end.

Chapter-VI, Bibliographies used for the study are arranged alphabetically in APA format of referencing and Appendices used for the study, given at the end.

Introduction

The scientific position of a university in the national and international context usually could be measured from both quantitative and qualitative point of view. The present study attempts to measure the research performance of Universities in West Bengal based on sample from the Scopus database for the period from 2001 to 2020. Further this study corresponds to an assessment of metrics analysis of the pattern of publication, authorship, growth rate of publication, citation pattern, journals coverage, subject wise contribution, countries collaboration, Organizational collaboration, visualization of different aspects related to research performance of the researchers from these Universities. Study also finds the social impact of highly cited articles by correlating citation data and altmetric

data. The study also measures the factors influencing the research productivity among the Research Scholars, Assistant Professors, Associate Professors and Professors based on the primary data.

Statement of the Problem:

Many kinds of sources (journal articles, conference proceedings, reviews etc.) have revealed the publications research productivity of Universities in West Bengal. Due to scattering of publications from these University's researchers haven't been visible to the policy makers of higher education. In order to overcome the problems stated above, the present title '*Research Performance of Universities in West Bengal: A Comprehensive Metric Study*' attempts to convert the publications into an organised structure.

Research Questions:

The problem stated above along with some necessary and relevant research questions to resolve the course of investigation.

The research questions to this direction may be as follows:

RQ1: What is the Pattern of Growth of Publications of Universities in West Bengal?

RQ2: What is the Pattern of Research Performance of Universities in West Bengal?

RQ3: What are the Factors Influencing the Research Productivity?

RQ4: What is the Social Impact of the Highly Cited Articles?

Objectives of the Study

The study has been designed with the following objectives:

- i. To explore the research performance, trends, and status of research outputs of Universities of West Bengal published during 2001-2020;
- ii. To examine the rate of growth of publications and examine the expected future growth of research output of universities in West Bengal;
- iii. To determine the authorship pattern and the nature of collaboration and identify the most prolific authors;
- iv. To identify the individual and institutional factors influencing the research productivity;
- v. To propose a model of influential factors regarding the growth of publication among Research Scholars and Faculty Members;
- vi. To identify the publication of universities being active or not in social platforms.

Scope and Limitations:

The following are the limitations to the study:

- i. This study is confined to the *Scopus* database only.
- ii. Publications data published from 2001 to 2020 only taken up for the study.
- iii. This study is based in the area of Sciences (excluding engineering, computer science and chemical science), Social Science and Arts and Humanities.

Methodology:

According to NAAC grading Six 'A' graded Universities of West Bengal are taken for this study. Primary and secondary data have been collected from the same six selected universities. The data for this study collected from both primary and secondary sources, primary data collected from the scholars and faculty members through hybrid mode of survey of the universities under investigation. The secondary data has been collected from Elsevier's Scopus database and altmetric attention score collected through dimension.ai database using doi of the highly cited papers. Metrics indicators has been used to present the research performance of the universities. Cronbach's α coefficient has been applied prior to data analysis to check the reliability of the instrument (questionnaire). Factor loadings in Principal Component Analysis (PCA) has been used to determine the indices. Further Binary Logistic Regression has been employed to check the significance of the indices.

Data Analysis and Interpretation:

The data analysis and interpretation are divided into three parts, in which the first part deals with the different aspects related to research performance of the universities taken for the study during a span of twenty years from 2001 to 2020 based on the secondary data indexed in Scopus database. The second part highlights the significant factors influencing research productivity among the research scholars and faculty members of different levels, the study of this part is based on the primary data collected from the scholars and faculties of the universities taken for the study. The third part of the chapter shows the social impact of the highly cited papers measured based on the altmetric attention score (secondary data) retrieved using the doi of the highly cited papers through dimension.ai database. The parts are described under the below mentioned headings.

- Part-I: 4a Research Performance of Universities in West Bengal During 2001-2020
- Part-II: 4b Factors Influencing Scholarly Publications: The Case of Six Top Universities in West Bengal
- Part-III: 4c Correlating Research Impact Using Citation Counts and Altmetrics Attention Score

Major Findings

- A steady growth in publications observed over the years for all the Universities under investigation. In Jadavpur University and University of Calcutta the growth of publications is on the higher side than the other universities.
- The result indicates that if the relative growth rate decreases the doubling time of the publication growth will increase in an inversely proportional ratio.
- The projection of trend analysis indicates that, a positive trend of growth for all the universities is noted and in next thirty years the publications will be doubled for most of the universities if present trend maintained.
- The researchers, faculty members of the Universities favoured the collaborative research work rather individual publications.
- It is found from the analysis that all the universities under investigation had published total 30934 documents during the period 2001 to 2020. Among all these publications 1829 publications (5.94%) found as recorded zero citations.
- Results of the analysis, in which influencing factors of research productivity has been measured which reveals that several factors have a substantial impact on the rise of publication productivity among the research scholars and faculty members of Universities in West Bengal. In case of the overall research productivity of an institution, the result found that among the individual variables gender and work experience have significance role on enhancing the productivity of the individuals as well as of the institutions for which he/she works for. The other individual variable, i.e. time spent on research has not found significant according to the result.
- The counts of Altmetric Attention Score of the top cited articles are mostly based by the use in platforms like Mendeley, Twitter, Facebook, as referenced in Patents, Wikipedia pages, in News Outlets etc.

Suggestions:

- Self-esteem of a researcher is the most important characteristics; striving for excellence is an important driver, so Universities need to look organise more programs for the development of such characters among the researchers.
- Young teachers need to be motivated for doing project works by giving a seed money from university fund. This will enhance research output, interaction with scholars, field survey, data collection based on which papers can be written.
- Good research can take place if teachers are not appointed in bureaucratic jobs. Research takes a backseat since a lot of time is taken away by regular teaching which in most situations do not follow the UGC workload division and administrative jobs.
- An environment of collaboration and cooperation amongst the departments under a university given the rise of interdisciplinary and multidisciplinary research activities.
- Institutional recognition to good researchers and smooth administrative support to research projects would ensure quality research.
- The respective universities need to encourage the scholars and faculty members in Social Sciences, Arts and Humanities and Interdisciplinary research as the number of quality research from these fields still lacking compared to Science based subjects.
- Research Advisory Committee of every department should be well updated regarding the latest research across the globe so that they can embrace and encourage new research issues without any pseudo-disciplinary narrow outlook.

Conclusions

The research performance of six top state universities of West Bengal has been analysed based on the literature available at Elsevier's Scopus database for a span of twenty years from 2001 to 2020. Based on the analysis of the secondary data, it is concluded that a gradual growth of publications was there among the universities of West Bengal and it is likely to be doubled in the next thirty years. Among the six universities, in terms of numbers of publications and received citations Jadavpur University and University of Calcutta is far ahead from other universities of the state.

It is also observed that the highly cited papers have been well spread among the social platforms, such as in twitter, Facebook pages, in Wikipedia pages, in blogs and used as reference in patents, policy sources and these articles are also active in news sources. It means highly cited works has also the high social impact. Citation and Altmetrics Attention or Mendeley Readership could not be replaced by each other, they can only complement each other. With citation, Altmetrics could be used as a supplement for assessing the impact of publications. So, it is recommended to the researchers to active in all the social platforms where his research can be share, it will increase the visibility of the work to the public more and will create some social impact which will result as to get more citation as well.

The factors influencing research performance has been analysed based on the primary data and it is found that the individual variables, viz. gender and work experience have significance role on enhancing the productivity. With this, Individual motivational factors and Institutional factors are also found significant (significance at <5% level) for the growth of research publications of an institution. The results also found that research support, academic environment is still not sufficient to influence the research activities in these universities. To overcome the problems, need more funding from the governments to this kind of top universities of the states in India.

Supervisor

Dated:

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Dated: