ISSN 2348-1218 (print)
International Journal of Interdisciplinary Research and Innovations ISSN 2348-1226 (online)
Vol. 6, Issue 3, pp: (108-112), Month: July - September 2018, Available at: www.researchpublish.com

Scientific Productivity of Engineering Colleges in Karnataka: A Scientometric Study

[1]Madegowda K.R., [2]Dinesh K. S.

Research and Development Centre, Bharathiar University, Coimbatore 641 046
[1] Librarian, Dayananda Sagar College of Engineering, Bangalore, Karnataka,India-560078
[2] Ph.D Supervisor, Research and Development Centre, Bharathiar University, Coimbatore 641 046

Abstract: **In this paper, the authors have presented a detailed literature review and the expected outcome from their research work. More than 100 relevant literary works have been consulted and reviewed for this study. The reviews shows that scientometric analysis is creating more visibility for the researches being carried out across the institutions. Scientometric tools are increasingly being used for assessments of qualitative and quantitative scientific research outcomes. This analytical study focuses on scientific and research productivity of the scientists and technologists working in engineering colleges of Karnataka. The Authors believe that the outcome of study will be useful in measuring research productivity, trends, collaborations and recognitions. Assessment of research performance by using scientometric method is a valuable technique for the identification of new scientific and technological knowledge. *The growth of literary works have become a main concern for scientists, researchers and library professionals as they have to keep themselves abreast* with the new developments in their subjects. It was seen from the available literary works that little study has been done in this field.**

Keywords: **ScientometricAnalyss, Scientometric Study, Scientific Productivity, Scientometric Tools, Research Performance Analysis, Engineering Colleges.**

1. INTRODUCTION

Scientometrics is the study of measuring and analysing science, technology and innovation (Wikipedia, 2017). Bibliometric and citation indicators are the most important impact measures of scientific literature productivity. Scientometrics are widely used to determine the scientific productivity of the country, institutions and at individual levels. Scientometric techniques are progressively used for the evaluation of qualitative and quantitative technical research outputs, some of*the important aspects which are intended to be analysed and studied are:

- Citations impact of publications
- H-index of authors and institutions
- Authorship pattern and their degree of collaboration
- Patents obtained
- Awards received for researches and innovations
- Other parameters of research outputs

The result of these studies help in*enhancing the visibility 'of institutions, trends of their research outputs, research partnerships. As a major outcome, the national and international funding agencies are to come *forward and render support towards researches and innovation.

Scientometric databases are flexible tools used to study, analyse, evaluate the research outputs and help in conducting comparative study of research growth at institutional, national, international levels. Scientometric databases are making great impact on furthering researches, developments and innovations in the world. Institutions across the globe are greatly benefitting from the scientometric databases and their visibility to the outside world is increasing constantly.

The evaluation of research performances using scientometric method, is a precious technique for identification of new scientific and technological knowledge.

2. NEED FOR THE STUDY

Outcome of the study helps in enhancing the visibility of engineering colleges. The study helps to understand the research impacts, research partnerships and collaborations, etc. This research output will support in ranking frame work and funding agencies to analyse the quality of research of the institutions based on their research productivity. It is found from the literature review that not much studies have been carried out on the scientometric study on research productivity of engineering colleges in Karnataka.

3. OBJECTIVES

The objectives of the study is to comprehend the scientific and research productivity of engineering colleges of Karnataka. Primarily, this study focuses on identification of research impact of publications; to find out the research partnerships and collaborations; to study the correlation among the various metrics; to rank the colleges based on the research impacts; to identify the availability of institutional repositories in the engineering colleges of Karnataka.

4. METHODOLOGY

In the research context, methodology refers to the systematic, practical and theoretical analysis of the methods applied to study in a selected field. For this research data, the major international scientometric databases such as Web^ of Science (WoS) &^Scopus will be used. These two databases have the highest credibility and reliability from scientists and investigators across the world.

5. SCOPE AND LIMITATION

The scope of the study is limited to the engineering colleges in Karnataka, established in 2005 and before.

6. REVIEW OF LITERATURE

The review of the published literature in this field is to know about the areas that have drawn the attention of the researcher so far and the areas that seek the attention of future researchers. Hence, a brief review of related literature and theories of the study under consideration is presented in this paper. &Review of literature is a significant element of any* research study. It gives the researcher a*bird's eye view of the*researches*done*till today in the specific field. Review of literature suggests new approaches to the solution of a chosen problem.

Literature review on the broad area of Scientific Productivity of Institutions/Organizations has been addressed.

6.1 Scientific Productivity of Institutions/Organizations:

Scientometric studies dealing with different subjects in science and engineering and technology in India have been reported in the^ literary works by (Karki et al., 2000) on scientometric dimension of*nuclear science*and*technology research in India: A*study based on INIS(1970-2002) by *(KademaniI et*al., 2006) on*Scientometric dimension of 2ThoriumL research in India by (Kademani et al., 2008) on *Scientometric1 mapping*oft Vacuum research!in nuclear science and technology by (Kademani et al.,2008) on a Scientometric*study of health*and population *research in *South Asia: focus on^ two*research*organizations; by1((Mahbuba et al.,2010). A study of research output of top eight Asian countries under various indicators by (Sangam S.L., and Bagalkoti, V.T., 2012), to determine the ranks, the total articles, citations,!subject areas, authors, 1institutional collaborations, 'international collaborations and h-index are taken into account. In this article, all the indicators measure quantifiable aspects of the application of science and technology. For this purpose, data has been collected from the Scopus international multidisciplinary1 bibliographical database. The artificial intelligence research output carried out by (Gunasekaran & Balasubramani, 2012) have been analysed between the year 1973 – 12011. The different q parameters, including authorship pattern, growth, ranks$ with global publication, institutions contribution, several productivity journals were analysed. The Scopus citation database was used to 'retrieve*the*data.

(Bordons et al., 2003) in their study focused on analyzing the productivity of the Spanisht Council for Scientific 'Research scientists in Natural Resources and Chemistry between 1994 -11999. A total of 260 literary works of Natural Resources scientists (24% females) and 2191Chemistry scientists (38% females) were studied; Glanzel (1996) undertook the study of National Research Performance in the six selected fields of Social Sciences for the period of 1990-

1992.where in , the bibliometric methods, which were used for1the evaluation of National Research Performance of hard and Life Sciences, were used; (Gupta et al., 2003) have examined the performance of five state universities of Karnataka (India) in seven broad fields:1physics, chemistry, engineering technology, clinical medicine, biomedical research, biology and earth and space science during the period 1996-2000. The study reveals that Mysore University, followed by Karnatak University, has reported maximum literary works, and chemistry and physics are the areas where maximum research has been done. Karnatak and Mysore University have high activity index in chemistry. (Gupta et al., 2011) analysed the research2 output*in*diabetes*during 21999-200811 on many parameters*including development, *rank & international publications! share, citation1 impact, on overall@ share*of international*collaborative*papers, and main collaborative partners. ^They studied the *characteristics of the most fruitful institutions and*authors. They also studied the highly*cited*papers, publications output, research impact. They compared the collaborative publication*share of India with China, South Korea and Brazil.

(Pradhan et al., 2011) studied the*trends in authorship pattern and collaborative research*in*Indian*chemistry *literature*with a*sample of 53,977 articles* that were downloaded from SCI-Expanded database*in*Web*of Science during the period 2000-2009; (Gupta et al., 2011) have analysed of the research productivity of*India in Computer *Science during* the period 1999-2008. Further a comparative study of publication productivity and impact of India in comparison with China, Taiwan and Brazil has been done. (Balasubramani and Murugan 2011) have taken up the research productivity of India in Tapioca. ^The extent of study covers the entire globe, and the period they have chosen is 1997 -2010. The main focus of the study is research of tapioca, its growth, share and impact in global publication. The publication output has impact!of most important institutions of*India; (Gupta and Bala,2011) have made an attempt to study the research publication on tuberculosis during 1998-2009 by referring to the Scopus database. They have gone through and studied the ^growth, *rank*and international publication*share, citation*impact, share of*international collaborative papers, contribution of main collaborative partner nations of research*communication in most*productive journals.

(Dirk Libaers,2006) made a study on organizing for scientific performance: The impact of organizational affiliation scientific productivity in Nano Science & Technology; Mehrnoush Mozaffarian (2008) made an attempt to study the gender difference1 in the authorship of Iranian journal articles. A list of articles published by Iranian authors in ISI journals in 12003 was obtained from the Web of Science; (Angela Repanovici, 2011)"in her study explains the*scientific*output* and*productivity to present*the major indicators for the measurement1 of the*scientific*activity. The author analyzed the 12008 research presentation as*documented* in its yearly* assessment that states the*number of*papers, books, and *research*contracts. In this study correlation indicators are presented and the significance of open* access*tools* and*repositories*for*increasing *the impact*of *scientific *research were *discussed.""(Obembe, 2012) examined the glow of the static contribution*of scientists*from the*sub-Saharan*Africa, particularly*Nigeria, to the global **production of*scientific*knowledge. He collected and*analyzed*cross-sectional*data on the*scientific* productivity of 771 researchers*from * the faculty*of science* in two**Nigerian**universities. The findings of the study reveals that,*academic*ranks, conference*attendance, membership in the*first*cohort group were important factors predicting* scientific*productivity of*scientists in the two universities; (Tseng et al., 2013) have carried out the work of witness for enlightening the*research@ *performance*of academic education1*in 1Taiwan, in *reply to the incentive *by *the countrywide^ research**projects. Publication record of more*than* 70,0001 over *the period of 11990–2011 were downloaded from ISI web of science and analyzed..

After the thorough review of literature, it is understood that, many studies**have**been done*on the analysis of research output and research impact of universities, institutions and countries. It is done on specific discipline or group1 of disciplines. Comparative studies and correlations on various parameters have been identified in literary texts. It was observed that, not any significant studies have been done on the scientific productivity of engineering colleges in the region. This gave a momentum to take up the current research.

7. CONCLUSION

This study helps the engineering colleges in Karnataka to know and understand their research productivity. It helps the national and international funding agencies to come forward for funding the future research projects. For the very first time National Institutional Framework (NIRF) under the MHRD is introduced in India. They given more importance to publications and productivity of the institutions. This study helps the colleges to understand where they stand in ranking of engineering colleges in Karnataka.

It is essential to study the research productivity of engineering colleges in the state/region. Such studies facilitate the*policy* makers* of*respective states to identify the most productive colleges, so that state government can give more attention towards the colleges with substandard research works and take measures to improve the quality in future.

REFERENCES

[1] Angela Repanovici(2011), "Measuring the visibility of the university's scientific production through scientometric methods: An exploratory study at the Transilvania University of Brasov", RomaniaPerformance Measurement and Metrics, Performance Measurement and Metrics, Vol. 12, No.2, pp.106-117.

[2] Bordons, M., (20031), "One step further in the production of bibliometric indicators at the micro level: Differences by gender and professional category of scientists", Scientometrics, Vol.57 , No.2, pp.159–173.

[3] Balasubramani, R., & Murugan, C.(2011), "Mapping of Tapioca (Sago) Research in India: A Scientometric Analysis", available at: http://unllib.unl.edu/LPP.

[4] Calkins, S, (1983), The new merger guidelines and the herfindahl-hirschman index. California Law Review, Vol.7 No.(2, pp. 402-429.

[5] Chang, D., Wu, C., Ching, G. S., & Tang, C. (2009), "An evaluation of the dynamics of the plan to develop first-class universities and top-level research centers in Taiwan", Asia Pacific Education Review, pp. 1-11.

[6] Dirk Libaers (2006), "Organizing for ! scientific performance: The impact of organizational affiliation scientific productivity in Nano Science & Technology", PICMET 2006 Proceedings , pp.115-125.

[7] Gupta, B.M. (2010), "A comparative study of India, China and South Korea S &T publications output during 1999-2008.", Annals of Library andInformation Studies, Vol.57, pp.207-22

[8] Gad Yair.(2009), " Gender, discipline, and scientific productivity: the case of Israeli doctoral students", Equal Opportunities International, Vol.28, No. 1, pp.50-64.

[9] Gupta, B.M., Munshi, U. M., & Mishra, P. K. (!2002), "S & T collaboration of India with otherSouthAsian Countries" , Current Science, Vol. 83 No.10, pp.11201-1209.

[10] Genetics and Molecular Biology during 19981-2007 in India: A Scientometric Analysis.DESIDOC Journal of Library and Information Technology, 30 (11)3-14.

[11] Garg, K. C., Dutt, B., & Kumar, S. (2006), "Scientometric profile of indian science as seen through science citation index", Annals of Library and Information Studies, Vol.53 No.3, pp. 114-125.

[12] Gunasekaran, M., &Balasubramani, R. (2012), "Scientometric Analysis of Artificial Intelligence Research Output: An Indian Perspective", European Journal of Scientific Research, Vol. 70, No.2, pp.317-322. .

[13] Gupta, B. M., (2003), "Performance of Indian universities in S & T research: A case study of five state university of Karnataka", Library Herald,Vol. 41 No.2, pp.128-136.

[14] Karki, M. M. S., Garg, K. C., & Sharma, P. (2000), "Activity and growth of organic chemistry research in India during 1971-1989''. Scientometrics, Vol. 49 No 2, pp.279-288.

[15] Kademani, B. S., Sagar, A., Kumar, A., & Kumar, V. (2008), "Scientometric mapping of vacuum research in nuclear science and technology: A global perspective", Journal of Physics: Conference Series, 114, 012054.1-012054.11.

[16] Kademani, B.S., Kumar, V., Sagar, A., & Kumar, A. (2006), "Scientometric dimensions of nuclear science and technology research in India: A study based on INIS (1970-2002) database", Malaysian Journal of Library and Information Science, Vol.11, No.1, pp.23-48.

[17] Mahbuba, D., Rousseau, R., and Srivastava, D. (2010), "A Scientometric analysis of health and population research in South Asia: focus on two research organizations". Malaysian Journal of Library & Information Science, Vol.15 No.3, pp.135-147.

[18] Mehrnoush Mozaffarian(2008), "Iranian women in science:a gender study of scientific productivity in an Islamic country, Aslib Proceedings: New Information Perspectives. 60(5), 2008 , pp.1 463-473.

[19] Repanovici, A. (2011), Measuring the visibility of the university's scientific production through scientometric methods: An exploratory study at the transilvania university of brasov, Romania. Performance Measurement and Metrics"Vol.12, No.2, pp.106-117.

[20] Sangamd, S. L. (2000), "Collaborative research in Psychology! in India: A Scientometric study. In Frank Havemann et al. (Eds.)", Proceedings of the Second Berlin Workshop on Scientometrics and Informetrics, Free University, Berlin, pp. 177-183.

[21] Sangam, S. L., &Bagalkoti, V. T.B (2012), "Science and Technology Research Output of Asian Countries Using Science and Technology Indicators", Contemporary Research in India, Vol.2 , No.4, pp.18-28.

[22] Olufemi B., Obembe.(2012), "Determinants of scientific productivity among Nigerian University academics", Indian Journal of Science and Technology, Vol.51No.2, pp.2155-2164.

[23] Yuen-Hsien Tseng (2013), "A scientometric analysis of the effectiveness of Taiwan's educational research projects", Scientometrics, Vol.95, pp. 1141–1166.