

Study of Research Output of Utkal University as Reflected in Scopus Database During 2008-2017

Bijayananda Pradhan

R K Mahapatra

Abstract

The present study is a bibliometric analysis of the research output of Utkal University, Bhubaneswar as reflected in Scopus database during the period 2008-2017. Utkal University is one of the oldest University of Odisha established before independence in 1943 situated in Bhubaneswar city. The Scopus bibliographic and citation database is used to retrieve ten years data of Utkal University, Bhubaneswar with a suitable search strategy. A total number of 1091 documents has been retrieved and analyzed using different indicators like: year wise contribution of research work, preferred document types of publications, ten most productive authors, subject wise contributions, most productive authors, preferred collaborating institution/country and most productive journals of the University. This study gives an idea about the core areas of research taking place in the University and it could be useful for the University authorities and policymakers to assess their major areas of research and focus on the most deprive/neglected areas of the subject in the future research work.

Keywords: Bibliometric Analysis, Research Productivity, Scopus, Odisha, Utkal University

1. Introduction

Research in common words refers to search for a new knowledge. Today huge amount of tax payer's money has been spent on different research and development work. Therefore, it is sometimes necessary to study the research output of any institution. In recent times techniques of quantitative application to measure the different activities of libraries has become more popular. Bibliometrics has become a standard criterion and a tool of science for taking policy decision and research management. Accordingly, there are certain quantitative measurement techniques are followed in this study to quantify the research productivity of Utkal University, Bhubaneswar.

1.1 About Scopus

Scopus is basically a bibliographic database containing abstracts and citations for peer reviewed academic journals produced by Elsevier in 2004. It is also called as the largest abstract and citation database of peer-reviewed literature which includes scientific journals, books, and conference proceedings etc., Scopus covers nearly 36,377 titles (22,794 active titles and 13,583 Inactive titles) from approximately 11,678 publishers, of which 34,346 are peer-reviewed journals in top-level subject fields: life sciences, social sciences, physical sciences and health sciences. It covers three types of sources: book series, journals, and trade journals. All journals covered in the Scopus database, regardless of who they are published under, are reviewed each year to ensure high-quality standards are maintained. Searches in Scopus also incorporate searches of



patent databases. Scopus gives four types of quality measure for each title; those are *h*-Index, Cite Score, SJR (SCImago Journal Rank) and SNIP (Source Normalized Impact per Paper). Anyone can find all included journals on the SCImago Journal Rank website (scopus.com).

2. Review of Literature

Review of literature suggests new avenues of approach to the solution of a chosen problem. The following literatures have been reviewed to accumulate a comprehensive idea pertaining to the present study:

Mahapatra and Jena (2006) evaluated the growth of scientific research output of Orissa published in *Orissan Studies* (1985-2004) a bibliographical compendium of published research output of Orissa. The study includes 875 research papers from 40 different journals, analyzed the data by their authorship pattern, category of journals, place of origin, length of papers and productivity of journals and found that there is a positive growth of research papers published from 1995 to 2004 and majority of the researchers prefer to publish their works in collaboration with others.

Majhi and Maharana (2012) evaluated research performance of faculties of different departments of Sambalpur University. The study found that among the broad disciplines of physical science the contribution to chemistry research is highest in comparison to the other departments because of team spirit and collaborative approach in physical science research as majority of research publications have been brought out in joint authorship.

Das, Rout, and Parida (2013) analyzed the publication patterns of Odisha. The data were collected from ISI

Web of Science for the period 1967-2011, found that from 1972, the publications grow steadily up to 1982 but after that the growth is irregular, then rapid growth noticed from 2006 onwards. Authors of State have collaborated with most of the developed countries of the world. It also shows that the publications of new institutes are increasing but publications of old colleges have decreased.

Swain, et al. (2013) examined the research productivity of KIIT University in regard to 361 papers indexed in Scopus from the year 2000 to February, 2013 and found that the majority of research are being carried by multiple authors and further revealed that authors of the same University have published maximum number of articles in computer science, followed by world academy of science, engineering and technology, comparative clinical pathology, and *International Journal of Information and Management Sciences*.

Aswathy and Gopikuttan (2013) while studying productivity pattern in Universities of Kerala found that the year wise distribution of publication indicates that there is a growth in the number of publications and also found that multi-authorship dominates among University teachers and there is no statistically significant difference between the experience and productivity. Professors are having a high degree of collaboration which indicates that increase in age and experience results in more collaborative papers.

Satpathy and Sa (2015) analyzed in their paper taking only the research outputs of state government universities of Odisha. The data were analysed from Scopus database during the period 2010-2014 using different aspects of bibliometric analysis. It was found that Utkal University is the most productive

institutions with 37.76% of total publications and growth rate of publication of the study is 105.63%. Physics and Astronomy is most preferred subject area having 20% of total publications.

The above review of literatures suggests that there are very few works has been done in the research productivity of Utkal University and especially taking on Scopus database. Hence this study has been taken to find out a comprehensive view of research productivity of Utkal University based on published literature as reflected in Scopus database.

3. Objectives of the Study

The major objectives of the study are as follows:

- ❖ To find out the year wise publications output of the university;
- ❖ To find out the preferred document types of publications of the university;
- ❖ To find out the most productive authors of the university;
- ❖ To find out the subject wise publications of the university;
- ❖ To find out the preferred collaborating institute of the university;
- ❖ To find out the preferred collaborating country of the university;
- ❖ To find out the preferred journals of publications of the university; and
- ❖ To find out the top five highly cited documents of Utkal university;.

4. Scope and Limitations of the Study

The present study shall be carried out in Scopus database of Elsevier Publishing group. Scopus is

the largest abstract and citation database of peer-reviewed literature: scientific journals, books, quality web sources and conference proceedings etc. The study is confined only to one University of Odisha i.e., Utkal University and for this study 10 years (2008-2017) of data has been chosen. A total of 1091 documents have been retrieved from the Scopus database and the same has been analyzed with different indicators.

5. Search Strategy & Methodology

The following search strategy has been used in Scopus database to retrieve the documents. The retrieved documents are than tabulated through MicroSoft Excel spreadsheet.

AF-ID ("Utkal University" 60025619) AND (LIMIT-TO (PUBYEAR , 2017) OR LIMIT-

TO (PUBYEAR, 2016) OR LIMIT-TO (PUBYEAR, 2015) OR LIMIT-

TO (PUBYEAR, 2014) OR LIMIT-TO (PUBYEAR, 2013) OR LIMIT-

TO (PUBYEAR, 2012) OR LIMIT-TO (PUBYEAR, 2011) OR LIMIT-

TO (PUBYEAR, 2010) OR LIMIT-TO (PUBYEAR, 2009) OR LIMIT-TO (PUBYEAR , 2008))

6. Data Analysis

The retrieved data from Scopus database has been analyzed as per the objectives mentioned above.

6.1 Year Wise Publications Output of the University

From data it is found that there is an increasing trend of publications output, but in the year 2013 and 2017, the productivity is found to be less as compared to the previous year. So, the growth rate of Utkal University is not upwards always and there is a downfall in between.

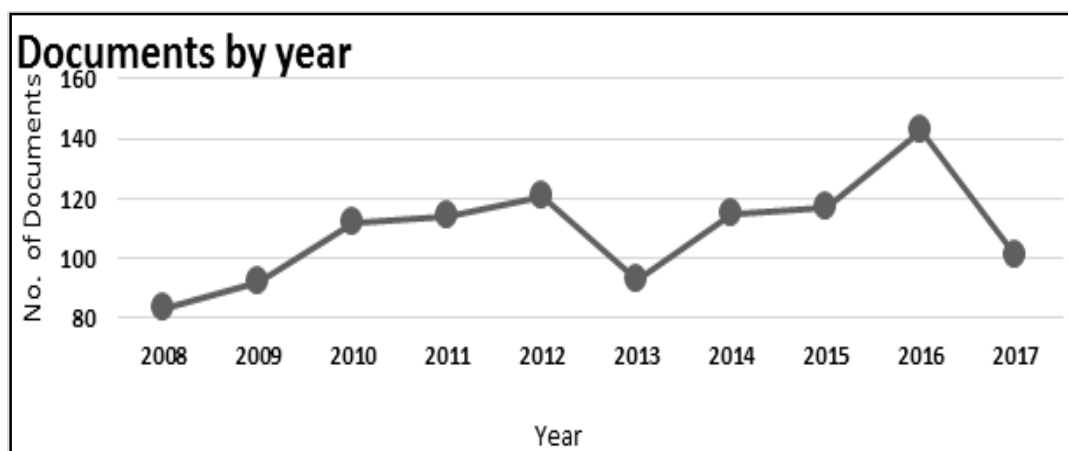


Figure 1: Year Wise Publications Output of Utkal University

6.2 Preferred Document Types of Publications of the University

Research works of any institutes has been published in so many sources., it is found that from a total 1091 publication of Utkal University, article (907, 83.1%) is the most preferable medium of publication followed by conference paper (114, 10.4%), reviews (32, 2.9%) and book chapters (27, 2.5%). The other documents types are not preferred by the authors of this University under study.

6.3 Most Productive Authors of the University

Top 10 most prolific authors of the University have been studied and their citation and h-index were also calculated. It is found from the data that, N.C. Mishra (59) has produced more numbers of documents followed by G.B.N. Chaiy (40), S.K. Mishra (36), R. Naik (29), S.K. Sahoo (27), P.K. Sahoo (27), P.K. Chand (24), P. Dash (24), S. Sahoo (22) and D.K. Basa (20). The second most productive author G.B. N. Chaniy has produced 40 documents, but he has got maximum citations with an h-index of 27 followed by P.K.

Chand with an h-index of 23. It shows that it is not true that if someone writes more papers, he or she will get more citations. It is the quality which matters. The h-index is an author-level metric that attempts to measure both the productivity and citation impact of the publications of a scientist or scholar.

6.4 Subject Wise Publications of The University

The subject wise publications of Utkal University, shows that the most productive top five areas of the University are: Physics and Astronomy (197, 11%), Pharmacology, Toxicology and Pharmaceutics (170, 9.5%), Environmental Science (148, 8.3%), Agricultural and Biological Sciences (123, 6.9%), & Engineering (123, 6.9%). The lowest productivity or neglected areas of the University are: Dentistry (1), Veterinary (2), Psychology (2), Health Professions (3), & Nursing (5).

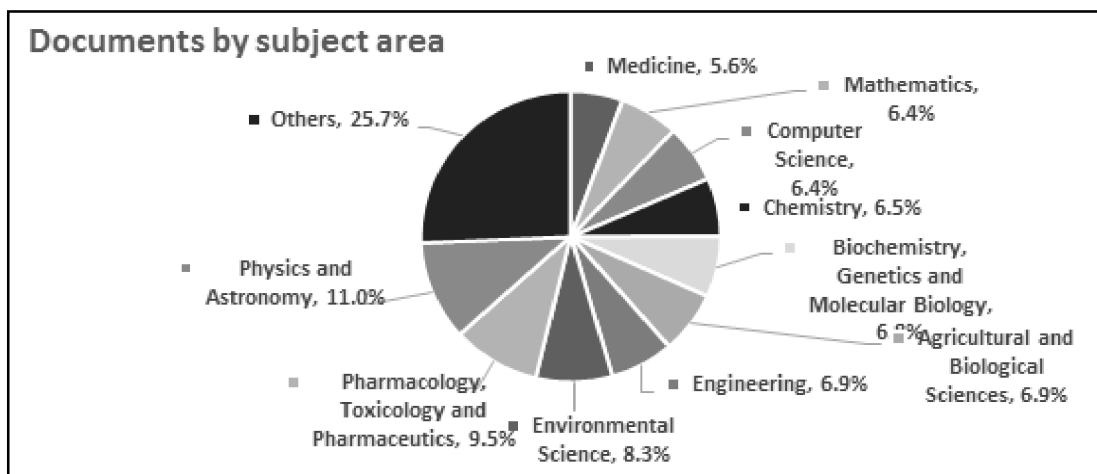


Figure 2: Subject Wise Publications of Utkal University

6.5 Preferred Collaborating Institute of the University

Research works are sometimes collaborated between the institutions. Accordingly the authors of the Utkal University have also collaborated between the institutions. From data it is found that the top ten collaborating institutions are: Siksha O Anusandhan University (73), North Orissa University (50), Tata Institute of Fundamental Research (39), Orissa University of Agriculture and Technology (38), Ravenshaw University (38), University of Melbourne (38), Kalinga Institute of Industrial

Technology (37), University of Tokyo (36), Inter University Accelerator Centre India (35) & Institute of Physics Bhubaneswar (35).

6.6 Preferred Collaborating Country of the University

The country wise collaboration of the Utkal University, shows that United States (55) is the most preferable partner followed by Italy (54), South Korea (48), Japan (46), Australia (41), Saudi Arabia (39), Poland (37), Austria (35), Germany (34), & Czech Republic (33).

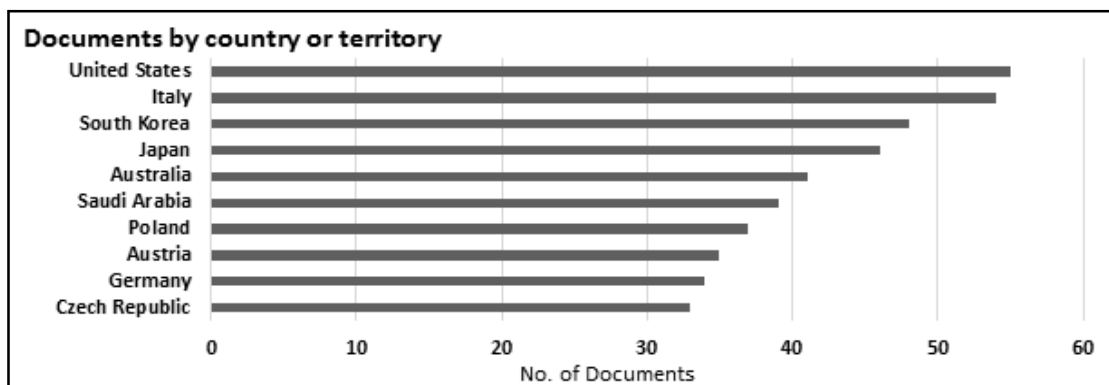


Figure 3: Preferred Collaborating Country of Utkal University

6.7 Preferred Journals of Publications of the University

The authors of this University have published their research work in so many journals. Data shows that Asian Journal of Chemistry (19) has produced more number of articles followed by International Journal Of Earth Sciences And Engineering (17), Indian Journal Of Physics (15), Physical Review D Particles Fields Gravitation And Cosmology (14), Advanced Science Letters (13), AIP Conference Proceedings (13), Physical Review D (13), International Journal Of Pharmacy And Pharmaceutical Sciences (10), & Economic And Political Weekly (10).

6.8 Top Five Cited Documents of Utkal University

It is noticed that, the top five highly cited documents of Utkal University are: "Geochemical speciation and risk assessment of heavy metals in the river estuarine sediments-A case study: Mahanadi basin, India" published by Journal of Hazardous Materials, in the year 2011 has got 267 citations followed by "Measurement of the branching ratio of

$B^- \rightarrow d(*) \tau^- \nu^- \tau^-$ relative to $B^- \rightarrow d(*) \nu^- \nu^-$ decays with hadronic tagging at Belle" published by Physical Review D - Particles, Fields, Gravitation and Cosmology in the year 2015 has got 186 documents. The third highly cited document is "Global, regional, and national age-sex specific mortality for 264 causes of death, 1980-2016: A systematic analysis for the Global Burden of Disease Study 2016" published by The Lancet in the year 2017 has got 182 citations. The fourth article which has got 173 citations is also from the publisher The Lancet entitled "Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990-

2016: A systematic analysis for the Global Burden of Disease Study 2016". The fifth highly cited document is "The Physics of the B Factories" published by European Physical Journal C published in the year 2014 has got 156 citations. It is also evident from the highly cited above articles that all the articles are a joint venture work. So many researchers are involved in all the five articles. It shows that in any research work collaborative works has got maximum numbers of citations because of the quality of works put by the different researchers.

7. Findings and Conclusion

- ❖ It is found from the study that there is an increasing trend of publications output, but in the year 2013 and 2017, the productivity is found to be less as compared to the previous year. This shows that there are ups and downs in productivity and no continuous growth of literature.
- ❖ It is also found from the study that article is the most preferable medium of dissemination of research work among the authors.
- ❖ The most productive author in terms of publication is N.C. Mishra (59) followed by G.B.N. Chainy (40) and in terms of citation G.B. N. Chaniy (2674) has got more numbers of citations and h-index (27) is also highest among the rest. The credibility and importance of any researchers depends upon the citation they receive from their work. Accordingly the more the h-index, the more is the importance of any researcher.
- ❖ The five core areas of research of the University are: Physics and Astronomy (197, 11%), Pharmacology, Toxicology and Pharmaceutics

(170, 9.5%), Environmental Science (148, 8.3%), Agricultural and Biological Sciences (123, 6.9%), & Engineering (123, 6.9%). The lowest productivity or neglected areas of the University are: Dentistry (1), Veterinary (2), Psychology (2), Health Professions (3), & Nursing (5). It shows that the University needs to focus more on the neglected subject areas.

- ❖ In collaborating institutions of the University, it is found that the University has more collaboration within the state institutes rather than outside the states. In this area the university should focus more on outside the state collaboration.
- ❖ As far as collaboration with foreign countries are concerned the University has a good number of collaboration the most advanced country USA followed by Italy.
- ❖ The preferred journal of publications shows that more numbers of articles are published in Asian Journal of Chemistry followed by International Journal of Earth Sciences and Engineering.
- ❖ The top cited article of the Utkal is "Geochemical Speciation and Risk Assessment of Heavy Metals in the River Estuarine Sediments-A Case Study: Mahanadi Basin, India" which is cited by 267 documents in the year 2011. It is also evident from the study that collaborative works are getting more number of citations than single author work. Therefore, nowadays every institution is looking for international collaboration, so that there will be a fair amount of exchange of ideas between the nations and the collective work will also helpful for sharing of knowledge.

References

1. ASWATHY, S. and GOPIKUTTAN, A. (2013). Productivity Pattern of Universities in Kerala: A Scientometric Analysis. *Annals of Library & Information Studies*, Vol.60No (03), 176-185.
2. DASH, J. N., ROUT, C. and PARIDA, B. (2013). Publications Productivity of Odisha in S&T: A Quantitative Study. *DESIDOC Journal of Library & Information Technology*, Vol.33No (04), 330-337.
3. MAHAPATRA, M. and JENA, P. (2006). Scientific Research Productivity on Orissa: A Bibliometric Analysis. *Annals of Library and information Studies*, Vol.53 No (01), 18-21.
4. MAJHI, S. and MAHARANA, B. (2012). Research Productivity of Physical Science Disciplines in Sambalpur University (Orissa): A Scientometric Study. *Journals of Arts, Science and Commerce*, Vol.04 No (01), 108-115.
5. SATAPATHY, S.K. and SA, M.K. (2015). Research Outputs of State Government Universities of Odisha: a Bibliometric Study. *Library Philosophy and Practice (e-journal)*, paper 1309.
6. SWAIN, D.K., ROUTARAY, B. and SWAIN, C. (2013). Scientometric Dimension of Research Productivity of a Leading Private University in India. *Library Philosophy and Practice (e-journal)*. Paper 933.

Further Reading

1. MAHAPATRA, G. (2000). *Bibliometric studies on Indian library & information science literature*. New Delhi: Crest Publishing House.

2. Odisha. Department of Higher Education. Task Force on Higher Education. Report (2009).
3. Available at <http://dheodisha.gov.in/DHE/pdf/FinalTaskforceReport.pdf>(Accessed on 10/08/2018).
4. PRADHAN, B.N. and MAHAPATRA, R.K. (2018). Scientometric Profile of Three State Government Universities of Odisha as Reflected by Scopus Database during 2006-2015. International Journal of Library and Information Studies, Vol. 08 No(01), 165-173.
5. PRADHAN, B.N. and MAHAPATRA, R.K. (2017). Growth of Research Publications in Social Sciences and Humanities in Odisha as Reflected in SCOPUS Database (1996-2015). SRELS Journal of Information Management, Vol. 54 No (01), 55-59.
6. Scopus Available at <http://www.scopus.com> (Accessed on 10/08/2018).

About Authors

Mr. Bijayananda Pradhan, Central Library, Central University of Orissa, Koraput.

E-Mail: ncsipradhan@gmail.com

Dr. R K Mahapatra, Head, PG Dept. of Lib. & Inf. Sc., Tripura University, Suryamaninagar, Tripura, India

E-mail: rkmahapatra@tripurauniv.in

Note:

Online version of this paper, associated data, files and other supplementary materials are available on Institutional Repository of INFLIBNET Centre. It can be accessed online by scanning QR Code or using following URI:
<http://ir.inflibnet.ac.in/handle/1944/2276>



