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Research Visibility and Impact of Faculty Members at Tumkur University: A Web of Science Analysis (2018–2022)

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ABSTRACT

The study examines the research visibility of faculty members at Tumkur University (India) in the Web of Science (WoS) database from 2018 to 2022. A total of 319 publications and 3,139 citations were recorded. Findings show a steady increase in citations over the years, with a significant positive correlation between year and citation count (supporting Hypothesis 2), but no significant correlation between year and publication visibility (rejecting Hypothesis 1). Nagabhushana H. emerged as the most productive and highly cited author, with an h-index of 23. Notably, publication output for top authors declined over time, despite rising citations. The most cited article (82 citations) focused on green synthesis of zinc oxide nanoparticles. The study highlights the importance of publishing in WoS indexed journals to enhance research visibility and impact, and recommends that faculty increase the number of high quality publications to improve institutional and individual academic standing in global citation databases.

Keywords: Research Visibility, Web of Science, Faculty Publications, Citation Analysis, H-index, Tumkur University, Bibliometrics, Research Impact

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1. Introduction

In recent times, scholarly publications have been crucial within higher education and research organizations. Additionally, it is observed that research publications are a fundamental component of the activities of research centers, governmental bodies, and university academic departments, particularly in the scientific realm. Truly, scientific publications are essential for systematically recording research outcomes and enabling the sharing of information among researchers [1] Mensah & Bekoe, 2010; [2] Klain Gabbay & Shoham, 2018; Mingle 2020). Research productivity denotes the generation of innovative concepts and ideas that, following both theoretical and practical investigations, culminate in the publication of articles in prestigious journals, patent applications, or documentation. The Web of Science is a prominent citation database that provides access to the foremost scholarly literature worldwide. Universities and research organizations have evaluated the performance of their academic and research personnel based on the scholarly contributions of their staff. The examination of online visibility is relatively novel, with ongoing trends emerging in this area of research. Research enhances an institution's visibility, which, in turn, influences its ranking. Individual researchers also benefit, as this fosters their professional growth and enhances their contributions to society. It elevates their profile, making them recognized authorities in their specialties. Thus, a researcher holds a highly significant role within an institution [3], [14] Udo Anyanwu, Adaora; Ibegbulem, Kelechi and Asuzu, Patience, 2023). Dang (2017) asserts that the influence of research extends beyond the confines of institutions, reaching into communities as new knowledge generates fresh ideas and innovations. Research publications are a critical aspect of the endeavors of research institutes, government organizations, and higher education institutions, especially among academic personnel. The effects of academia can be observed within the scientific community through effective dissemination of research. Recognizing the significance of research productivity and its impact, the current study seeks to explore the research visibility of faculty members at Tumkur University, Tumakuru. The Web of Science database has been used to assess the visibility of articles authored by faculty members.

2. Review of Literature

The researcher's visibility in Web of Science depends on publication in indexed sources, accurate author identification, citation impact, and active profile management. While WoS offers robust metrics and credibility, it represents only a portion of the global research landscape.

Faculty research visibility in Web of Science varies significantly across institutions, with substantial gaps in coverage and notable differences compared to other databases.

The evidence from multiple institutional studies reveals mixed patterns. Four major studies examining specific universities found varying levels of WoS representation: Goa University produced 1,218 articles over 10 years (2008-2017) [5] Jayaprakash G Hugar et al., 2019, while Jawaharlal Nehru University contributed 5,007 publications across four decades (1971-2010) [6] M. Tripathi et al., 2015). However, coverage gaps are substantial - approximately 70% of researchers at the University of Zululand and Moi University were not indexed in WoS [7] D. Ocholla et al., 2016. The comparative analysis shows WoS consistently underrepresents faculty output relative to other databases. Tamil Nadu Agricultural University faculty published 1,980 articles

in WOS compared to 4,372 in Scopus during 2001-2020 [8] M. Sankar et al., 2023. The studies suggest WoS visibility is influenced by publication language, journal selection, and disciplinary focus, with international collaboration and English language publications receiving better representation [6] M. Tripathi et al., 2015).

A plethora of research has already been conducted on the research visibility of faculty members. [9] Agarwal et al. (2016) were of the view that evaluating researchers and their research impact in modern times has become increasingly popular since a researcher's number of publications can easily be retrieved from any primary research database, such as Pubmed, Scopus, and Web of Science. [10] Yliopisto (2019) stated that the choice of where to publish one's article is a vital factor contributing to the visibility of such articles. Visibility, according to Hermann (2018), has become the new name of the scholarly reputational game, referring to the ability to place one's work in the scholarly marketplace. [11] Ogunleye (2019) stated that the visibility of publications could be enhanced when journals use the very popular 7 databases. Such databases include Ulrich's Web, Web of Science and Scopus. The Web of Science, described as the most trusted publisher-independent citation database worldwide, is acclaimed as the search engine that affords researchers excellent access, reliable discovery, and assessment [12] (Web of Science Group, 2019). [13] Mingle, Achampong and Acheampong (2020) stated that regarding academic publications, web presence indicators may include: keywords (pointers to a scientist's area of specialization), choice of journal (journal impact factor), and parent institution (website mentions/profiles and Institutional Repository), number of hits (total number of works/ articles in a Google search); and citation counts (how many times an individual have been cited).

3. Research Questions

The following research issues are formulated:

a) What is the research visibility of faculty members as reflected in Web of Science?
We intend to investigate to the extent to which a researcher's scholarly output is indexed, cited, and recognized within the Web of Science Core Collection.

b) How many citations are received by the faculty members during 2018-22?
The average citation count for scientific papers varies widely by field, publication type, and time frame, typically ranging from under 1 to several dozen citations per article, with review articles tending to receive greater numbers than original research papers. Against this backdrop, we measure the citations received by faculty members over the five years 2018-22. We believe that this analysis will help us understand the impact of the papers and changes.

c) Who is the most productive author based on the research visibility and citations received?
Author productivity in science is primarily measured by bibliometric indicators, including publication counts, citation counts, and composite indices such as the h-index, with supplementary metrics, such as journal impact scores, collaboration patterns, and altmetrics, used for broader assessment. Publication Count is a straightforward measure of how many research papers an author has published in a given timeframe.

d) What is the H-index of faculty members as reflected in Web of Science?
The h-index is an author-level measure used to gauge the significance of a researcher's work. The index is determined by combining the number of publications and the number of times they have been cited by others. In our work, we identify the H-index of the authors for the papers we process.

4. The hypotheses of the study

The following hypotheses are formulated:
H1. There is a significant correlation between the year and the visibility of records.

H2. There is a significant association between the year and number of citations received.

H3. There is a positive correlation between the articles of the faculty members found in the Web of Science and the year.

5. Scope and Methodology

The data was collected from the Web of Science database using the keyword "Tumkur University". The number of records found against the word "Tumkur University" in the Web of Science during the last 5 years (2018-2022) are downloaded and recorded in the MS Excel sheet for further analysis.

6. Data Analysis and Interpretation

Years	Visibility of Records	Percentage	p-value	r
2018	55	17.2	.092	.816
2019	61	19.1		
2020	52	16.3		
2021	70	21.9		
2022	81	25.4		
Total	**319**	**100**		

Table 1. Research visibility as reflected in Web of Science by the year

Table 1 presents the research visibility of faculty members at Tumkur University (in the present study, research visibility refers to the number of records in Web of Science). The table shows that a total of 319 records were found in the Web of Science from January 2018-2022. It is also observed that the most significant number of articles are found in 2022 (81; 25.4%), and the fewest in 2020 (52; 16.3%). To know the association between the year and the number of articles included in the Web of Science, Pearson's correlation has been applied. The study's results show that there is no significant correlation between year and record visibility ($r = .816$, $p = .092$). Thus, the first hypothesis "There is a significant correlation between the year and the visibility of records is rejected.

The present study also tried to know the number of citations received by faculty members, and the data is presented in Table 2. It can be seen in the table that a total of 3139 citations are received by the articles published by faculty members during 2018-2020. The highest number of citations was in 2022, with 1154 (36.8%), and the lowest was in 2018, with 72 (2.3%). Further, citation counts have increased over the last five years in the Web of Science database. The Correlation test indicates that there is a significant association

between the number of citations received and the year since the p-value is less than 0.000 and hypothesis 2 is accepted.

Years	Number of citations received	Percentage	p-value	Correlation value
2018	72	2.3	.000	5
2019	382	12.2		
2020	590	18.8		
2021	941	30.0		
2022	1154	36.8		
Total	3139	100		

Table 2. Number of citations received by faculty members

Name of the Authors	2018	2019	2020	2021	2022	Total	Ranking	p-value	r
Nagabhushana H	49	36	18	29	14	146	1	.059	-.864
Girish K S	8	8	5	1	1	23	2	.015	-.947
Sreenivasa Swamy	4	6	6	2	3	21	3	.358	-.530
Raghavendra Kumar P	3	5	4	1	3	16	4	.474	-.426
Suchetan P.A	3	1	6	2	0	12	5	.572	-.343
Devaraja S	2	0	4	0	4	10	6	.604	.316
Gaonkar Narayan	1	1	2	3	2	9	7	.139	.756
Chandrali B	0	0	0	3	4	7	8	.042*	.892*
Suresh D	1	0	1	2	3	7	9	.081	.832
Malleshappa J	1	1	0	1	3	6	10	.308	.577

Table 3. Ranking of authors based on visibility of articles

*Correlation is significant at the 0.01 level (2-tailed).

The study also sought to determine the most productive author based on the visibility of their articles, as reflected in the Web of Science. Table 3 shows that, among the top 10 faculty members, Nagabhushana H. has the highest publications (146) and secured 1st rank, followed by Girish K.S (23) and Sreenivasa Swamy (21), who secured 2nd and 3rd rank, respectively.

It is also noticed that the number of articles found in the Web of Science from 2018 to 2022 declined for the top 5 most productive authors. The correlation test has also been applied and it is found that the top five most productive authors have a negative correlation between the articles found in the Web of Science and the year.

Name of the Authors	2018	2019	2020	2021	2022	Total	Ranking	p-value	r
Nagabhushana H	47	250	297	462	546	1602	1	.002	.984**
Girish K S	0	40	80	105	81	306	2	.057	.867
Sreenivasa S	3	15	33	69	86	206	3	.002	.985**
Raghavendra Kumar P	0	10	33	42	58	143	4	.001	.992**
Suresh D	3	0	16	43	64	126	5	.014	.947*
Devaraja S	0	6	20	36	56	118	6	.002	.984**
Chandrali B	0	0	0	14	77	91	7	.108	.795
Suchetan P. A	3	6	19	37	0	65	8	.674	.259
Vijayakumar G. R	2	7	0	11	0	20	9	1.000	.000
Narayan Gaonkar	1	1	4	5	8	19	10	.008	.965**

Table 4. Ranking of Authors based on Citations

****Correlation is significant at the 0.01 level (2-tailed)**

***Correlation is significant at the 0.05 level (2-tailed)**

The ranking of Authors based on Citations is presented in Table 4. The table shows that among the top 10 faculty members, Nagabhushana has received the highest number of citations (1602) and secured 1st rank, followed by Girish K.S. (306) and Sreenivasa Swamy (206), who secured 2nd and 3rd rank, respectively. The study's significant finding is that most authors have received a substantial number of citations for their research papers. The correlation test also indicated a positive correlation between the year and the number of citations received by most faculty members, except Girish, Chandrali, Suchetan, and Vijaykumar.

Table 5 shows the ranking of authors based on H-Index. Of the top 10 faculty members of Tumkur University, Nagabhushana has the highest number of h-Index (23) received and secured 1st rank followed by Sreenivasa Swamy (10) and Girish K.S (8) who got 2nd and 3rd rank respectively.

Table 6 presents the most cited articles from the Web of Science databases in the year. It is found that the article entitled "Green synthesis of zinc oxide nanoparticles from the leaf, stem and in vitro grown callus of Mussaenda frondosa L.: characterization and their applications" by Jayappa et.al, published in 2020 received 82 citations. Another highly cited article is "Green synthesis of zinc ferrite nanoparticles in Limonia acidissima juice: Characterization and their application as photocatalytic and antibacterial activities" by Naik et.al, published in 2019 which received 76 citations.

Name of the Authors	Article Included	Citation	H-Index	Ranking
Nagabhushana H	146	1602	23	1
Sreenivasa Swamy	21	206	10	2
Girish K S	23	306	8	3
Raghavendra Kumar P	16	143	8	4
Suchetan P. A	12	65	6	5
Chandrali B	7	91	5	6
Suresh D	7	126	4	7
Devaraja S	8	118	4	8
Vijayakumar G. R	5	20	4	9
Malleshappa J	6	11	3	10

Table 5. Ranking of authors based on H-Index (Top-10 Authors)

Title	Authors	Name of the Journals	JIF	Publication Year	Total Citations	H-Index
Green synthesis of zinc oxide nanoparticles from the leaf, stem and in vitro grown callus of Mussaenda frondosa L.: characterization and their applications	Jayappa, MD et.al.	Applied Nanoscience	3.869	2020	82	16

Green synthesis of zinc ferrite nanoparticles in Limonia acidissima juice: Characterization and their application as photocatalytic and antibacterial activities	Naik, MM (Naik, M. Madhuka et.al.	Microchemical Journal	5.304	2019	76	21
Rapid identification of latent finger prints, security ink and WLED applications of CaZrO3:Eu3+ fluorescent labelling agent fabricated via bio-template assisted combustion route	Navami, D et.al.	Journal of Alloys And Compounds	6.371	2018	75	15
The Role of Reactive Oxygen Species and Ferroptosis in Heme-Mediated Activation of Human Platelets	NaveenKumar, SK et.al.	Acs Chemical Biology	4.634	2018	57	24
EGCG assisted Y2O3:Eu3+ nanopowders with 3D micro-architecture assemblies useful for latent finger print recognition and anti-counterfeiting applications	Marappa, B.	Sensors And Actuators B-chemical	9.221	2018	52	15
Facile LaOF: Sm3+ based labeling agent and their applications in residue chemistry of latent fingerprint and cheiloscopy under UV-visible light	Suresh, C	Arabian Journal of Chemistry	6.212	2018	48	17
Antimicrobial, anticoagulant and antiplatelet activities of green synthesized silver nanoparticles using Selaginella (Sanjeevini) plant extract	Dakshayani, S. S.	International Journal of Biological Macromolecules	8.025	2019	46	15
Large-scale controlled bio-inspired fabrication of 3D CeO2:Eu3+ hierarchical structures for evaluation of highly sensitive visualization of latent fingerprints	Deepthi, N. H	Sensors And Actuators B-chemical	9.221	2018	48	15
SiO2@LaOF:Eu3+ core-shell functional nanomaterials for sensitive visualization of latent fingerprints and WLED applications	Suresh, C.	Journal of Colloid And Interface Science	9.965	2018	42	15
Hemin-induced platelet activation and ferroptosis is mediated through ROS-driven proteasomal activity and inflammasome activation: Protection by Melatonin	aveenKumar, Somanathapura K.	Biochimica Et Biophysica Acta-molecular Basis of Disease	6.663	2018	42	15

Table 6. The most cited articles (Top-10) (2018-2022)

6. Discussion and Conclusion

The present study found several interesting results regarding the research visibility of faculty members at Tumkur University. Firstly, the study shows that the authors have published more research articles in the Web of Science over the last 5 years.

The study found no significant correlation between year and record visibility (r = .816, p = .092). The survey also shows that a total of 3139 citations were received for the articles published by the faculty members during 2018-2020. The Correlation test indicates that there is a significant association between the number of citations received and the year.

Further, it is observed that the number of articles found in the Web of Science from 2018 to 2022 has declined for most authors. In this context, it is recommended that faculty members publish more articles in scholarly journals to gain greater visibility in various citation databases, viz., Scopus and Web of Science. Since the number of articles has declined over the last five years, faculty members need to continue publishing high-quality articles in various national and international journals to increase visibility.

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