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An Analysis of the Research Productivity of Faculty Members: A Case Study of Bishop Heber College, Tiruchirappalli

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Abstract

This paper presents a bibliometric analysis of the Bishop Heber College research output, over the 20 years' period from 1998 to 2018. In a period of 20 years, Bishop Heber College has published 599 publications of which were published in the highly reputed journals (SCOPUS listed journals) in core subjects of Science and Humanities with the average of 10 papers per year. Over the last 10 years' time period has increased research publications over the most recent 7-year window compared with the first 10 years. Based on citations, from 2007 to 2011, the average citation rate is high and the institute has published 119 research articles during this period. The number of citations highest (343 citations) in the year 2010 (29 publications; with citation 24 publications; in the average number of citation per article is 11.83). The degree of collaboration is 0.98 and collaboration index is lowest in the year 1988 (2.00) and highest in the year 2010 (4.76). The compound annual growth rate is .3768 or in percentage 37.68%. The highest number of collaborations (based institutions) with Bharathidasan University and country wise with Ireland has 15 publications. Overall, the Bishop Heber College research is well-cited and published with top-ranked journals in the globe.

Keywords: Bibliometrics, Scientometric, Bishop Heber College, Research Productivity, Authorship Pattern, research output.

Introduction

The measurement of the institutional research outputs helps to identify the faculty members teaching, research activities, institutional ranking, and reputation of the institute. The evaluation of publication and citations data is used by all countries around the world for measurement of the research outputs, and bibliometric analysis is a powerful tool used in research performance assessment. The current study has sought to analyze the research potential of Bishop Heber College, Tiruchirappalli by using bibliometric techniques.

Profile of the Institute

The Bishop Heber College is a Christian educational institution located in Tiruchirappalli, Tamil Nadu, India. This institute was founded in the year 1966. The University Grants Commission, New Delhi, and Bharathidasan University, Tiruchirappalli granted Autonomy to the College during 2004-2005. The College was accredited with 5 stars (A+ level) by the National Assessment and Accreditation Council (NAAC). The college was awarded as College with Potential for Excellence" and "College of Excellence" by UGC.

In recent 2018 and 2017 in National Institute Ranking Framework (NIRF) ranking, the college bagged the 3rd and 4th rank among the top arts colleges in the country and 1st and 2nd Rank at the State level and 1st Rank among the affiliated colleges of the varsity. The college makes a great reputation for its higher education standards and draws students from India and abroad.

Review Literature

Kalimuthu, K., Jayabal, R., & Baby, K. (2018)¹ investigated the research productivity of Bharathiar University, Tamilnadu using the bibliometric techniques. The study analyzed 4265

papers and found the highest number of publications was in the year 2016, mean relative growth rate (0.31) has shown a declining trend and the mean doubling time (2.21) has shown an increasing trend, collaboration trend is towards multi-authored. The degree of collaboration (0.99), the collaborative index may vary every year. It was minimum in the year 2014 (3.53) and maximum in the year 2016.

Prasad, J.G., & Yasmin, M. (2018)³ analyzed the scholarly publications of Bishop Heber College from *WoS* database. The study found the publication growth rate is very low up to 2010. After 2011, the overall publication growth rate is high and increased. Particularly in the year 2017 with the highest publication of 30 research articles.

Yasmin, M., & Prasad, J.G. (2018)⁴ investigated the research publications of the faculty members of three arts and science colleges from Sivakasi between 1998-2018. The study found that overall research productivity is very low. The study concluded that, if the college administrations will encourage and support for quality research, the faculty members are eager to engage in research publications with top-ranked journals. It helps the institution to increase their research productivity and to benchmark with other central/state-funded institutions.

Jena, K. L., Swain, D.K., & Sahu, S.B. (2012)¹¹ measured the coverage and quality of contributions of the electronic library from 2003-2009 towards LIS literature. The study found that the majority of articles published in the category of research papers. The study revealed that the average length of articles is 13.017 pages and the contributors are limited to few countries.

Pastor, J.M., Serrano, L., & Zaera, I. (2015)⁷ reveals “higher educational institutions produce knowledge through academic productivity of research. HEIs contribute to the socioeconomic development of their areas producing various positive effects on the environment in many social and economic variables”.

Jabeen, M... [et.al.]. (2015)⁹ explored the quantitative analysis, growth rate and global publications in the field of library and information science. The study revealed that a total of 18,371 were published from 2003-2012. The study found that a significant growth rate (11.37%) in the year 2009. Self-citation tendencies have increased and in terms of collaborative publications, China has contributed more.

Need for the study

The purpose of this study is to investigate quantitatively the Bishop Heber college research output by using bibliometric analysis and mapping techniques using SCOPUS database.

Objective of the Study

- To find out the citations received, year-wise productivity, types of publications
- To examine the productive authors
- To examine the authorship pattern
- To evaluate the relative growth rate, the degree of collaboration, Collaboration Index, Compound Annual Growth Rate
- To examine national and international collaboration
- To identified the preferred journal
- To identify the top ten publications

Methodology

The data retrieved from the Scopus database by searching the keyword of "Bishop Heber Coll". This database is one of the leading comprehensive citation databases in the world. The analysis is based on the research output of faculty members of Bishop Heber College, Tiruchirappalli. The time span was set from 1998 to 2018 as covered in the Scopus.

ANALYSIS AND DISCUSSION

Year wise growth rate of publication

Year	No. of Publications	Percentage of Total Publications	Growth rate of Publications	Articles with Citation	Articles without citation	Citations	Average Citations Per Articles	Growth rate of citations
1988	1	0.17		1	0	40	40	
1989	1	0.17	0.00	1	0	8	8	-80.00
1990	1	0.17	0.00	1	0	5	5	-37.50
1994	1	0.17	0.00	1	0	1	1	-80.00
1996	1	0.17	0.00	1	0	1	1	0.00
1997	1	0.17	0.00	0	1	0	0	-100.00
1998	5	0.83	400.00	4	1	12	2.4	120.00
1999	3	0.50	-40.00	3	0	33	11	175.00
2000	7	1.17	133.33	5	2	33	4.71	0.00
2001	10	1.67	42.86	6	4	28	2.8	-15.15
2002	6	1.00	-40.00	5	1	23	3.83	-17.86
2003	18	3.01	200.00	10	8	52	2.89	126.09
2004	12	2.00	-33.33	8	4	26	2.17	-50.00
2005	11	1.84	-8.33	9	2	47	4.27	80.77
2006	10	1.67	-9.09	5	5	8	0.8	-82.98
2007	11	1.84	10.00	4	7	71	6.45	787.50
2008	18	3.01	63.64	12	6	184	10.22	159.15
2009	24	4.01	33.33	19	5	260	10.83	41.30
2010	29	4.84	20.83	24	5	343	11.83	31.92
2011	37	6.18	27.59	28	9	273	7.38	-20.41
2012	29	4.84	-21.62	17	12	103	3.55	-62.27
2013	38	6.34	31.03	28	10	234	6.16	127.18
2014	52	8.68	36.84	42	10	291	5.6	24.36
2015	73	12.19	40.38	49	24	296	4.05	1.72
2016	110	18.36	50.68	43	67	127	1.15	-57.09
2017	67	11.19	-39.09	23	44	80	1.19	-37.01
2018	23	3.84	-65.67	1	22	1	0.04	-98.75
Total	599	100.00		350	249	2580	4.31	

Table 1



figure 1

Table 1 depicts the number of papers published from 1988 to 2018, In all, 599 papers were published during the study period. The study found that, before 1997, the research output rate was very low. From 1988-1997 (almost one decade) only 6 research papers have published. The first research paper was published in the year 1988 and it has 48 citations. It is a very good sign for stepping into quality research productivity of the Bishop Heber College.

After 1998 the publication rate is gradually increased. The study found that the highest number of publications in the year 2016 with 110 publications. It also indicates that 70% of the total publications are contributed during the last 8 years (2011-2018: 429 publications).

Analysis of the trends of the study annual output shows that Bishop Heber College has consistently published on average of 10 papers per year over the last 10 years' time period and has increased research publications over the most recent 7-year window compared with first 10 years.

The main reason for significant growth published in 2011-2018 may be, in the year 2009 University Grand Commission has introduced the scheme called career advancement for the faculties. This scheme helps faculty members to focus on research and academics.

Citations

From the year 2007 to 2011, the average citation rate is high and the institute has published 119 research articles during this period. Out of 119, 82 articles have highly cited research papers. In all, the articles published in the year 2010 (29 publications) have made the highest number of citations (343). Overall, the number of citation is highest (343 citations) in the year 2010 (29 publications; with citation 24 publications; in average number. of citation per article - 11.83) followed by 2009 with 24 publications; 19 articles cited; in average no. citation per article-10.83. The number of citations per article calculated as total number. of citations divided by number of articles.

In all, out of 599 research output, 350 papers are with citations & citation free 249 papers. Which indicates that the authors' productivity is innovative and quality output in their research field. In all, 599 publications with 2580 citations and citations per paper are found to be 4.31.

Productive Authors

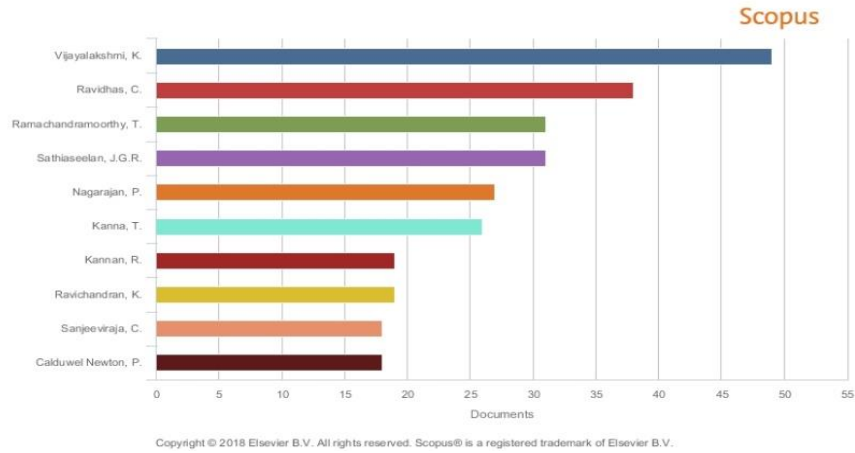


figure 2

The above *figure 2* represents the 10 most productive authors having contributed a maximum number of publications from Bishop Heber College, Tiruchirappalli. Prof. Vijalakshmi K is the most productive author and contributed 49 publications, followed by Prof. Ravidhas C with 33 Publications, Prof. Ramachandra Moorthy T with 31 publications, Prof. Sathiyaseelan .J.G.R with 30 publications, Prof. Nagarajan P with 27 publications, Prof. Kannan R and Prof. Ravichandran K each with 19 publications Remaining two authors with 18 and 13 publications.

Citation-Based Prolific Author

Author	Documents	Citations	Average
Ravidhas C.	33	454	14
Vijayalakshmi K.	49	370	8
Kanna T.	26	305	12
Sanjeeviraja C.	18	262	15
Dhanuskodi S.	10	231	23
Sabari Girisun T.C.	15	220	15
Moses Ezhil Raj A.	12	215	18
Lakshmanan M.	12	211	18
Vijayajayanthi M.	10	201	20
Jayachandran M.	7	176	25
Karthick K.	17	162	10
Ramachandra Moorthy T.	31	144	5
Ravichandran K.	19	135	7
Ramy M.	6	117	20
Sivasankar V.	15	113	8
Sakkaravarthi K.	13	104	8
Gopalakrishna D.	6	96	16
Chen S.-M.	12	87	7
Govindasamy M.	11	87	8
Mani V.	10	87	9

Kalavathy S.	8	83	10
Merlin J.P.	13	70	5
Venkatesh R.	16	69	4
Sudhagar P.	8	68	9
Amirtharaj E.C.H.	7	67	10
Evans D.J.	6	64	11
Murugesan K.	6	64	11
Chandramohan A.	6	56	9
Renitta A.	8	56	7
Nagarajan P.	27	53	2
Dhayabaran D.P.	6	52	9
Miller J.J.H.	14	50	4

Table 2

The above *table 2* represents the prolific author based on the maximum number of citations and average citations. Prof. Ravidas is the most prolific author based on maximum number of citations (33 document with 454 citations) followed by Prof. Vijayalkshmi K (49 publications with 370 citations).

This study inferred that according to average number. of citations, Prof. Jayachandran M having highest average score 7 publications; 176 citations; Average score: 25 is the most prolific author followed by Prof. Ramya M (6 publications; 117 citations; average score: 20).

Type of Publications

Document Type	No of Publications	Cumulative No.	Percentage	Cumulative Percentage
Article	488	488	81.47	81.47
Conference paper	84	572	14.02	95.49
Book chapter	12	584	2.00	97.50
Review	7	591	1.17	98.66
Editorial	5	596	0.83	99.50
Letter	2	598	0.33	99.83
Erratum	1	599	0.17	100.00

Table 3

The above *Table 3* the data set contain 599 publications extracted from SCOPUS database. The dataset encompasses 488 research papers, 84 conference papers, 12 book chapter, 7 reviews, 5 editorial papers, 2 letter and 1 erratum. Nearly 80% of publications are in research articles category (81.47%); followed by conference papers (14.02%), Book chapters (2%). The study inferred that, the authors are more interested to publish research articles than any other category.

Authorship Pattern

Authors	No of Articles	Cumulative	%	Cumulative %
Single	14	14	2.34	2.34
Joint	238	252	39.73	42.07
Three	148	400	24.71	66.78
> Three	199	599	33.22	100

table 4

The study released the highest publication of 238 papers with 694 citations in two authors, 148 articles written by the three authors and the highest citation of 770. However, the single author's contribution is very low. The data revealed that, Bishop Heber College teachers are engaged in publishing their research papers with two or more authors.

Degree of Collaboration

The degree of collaboration is defined as the ratio of the number of collaborative research papers to the total number of research papers in the discipline during a certain period of time. The extent of collaboration in research can be measured with the help of the formula suggested by Subramanian (1983)¹² used in this study. It is expressed as where;

Where, C = Degree of Collaboration

NM= Number of multiple authors

NS= Number of single authors

$$C = \frac{N_m}{N_m + N_s}$$

Year	Single Author	Multi-Author	No. of Publications	Degree of collaboration
1988	0	1	1	1.00
1989	0	1	1	1.00
1990	0	1	1	1.00
1994	0	1	1	1.00
1996	0	1	1	1.00
1997	0	1	1	1.00
1998	1	4	5	0.80
1999	0	3	3	1.00
2000	0	7	7	1.00
2001	1	9	10	0.90
2002	0	6	6	1.00
2003	0	18	18	1.00
2004	1	11	12	0.92
2005	0	11	11	1.00
2006	0	10	10	1.00
2007	0	11	11	1.00
2008	1	17	18	0.94
2009	0	24	24	1.00
2010	0	29	29	1.00
2011	0	37	37	1.00
2012	1	28	29	0.97
2013	1	37	38	0.97
2014	0	52	52	1.00
2015	0	73	73	1.00
2016	5	105	110	0.95
2017	3	64	67	0.96
2018	0	23	23	1.00
Total	14	585	599	0.98

table 5

The above *table 5* indicates the degree of collaboration in research output of Bishop Heber College. The degree of collaboration is 0.98 during the study period (single authors publications 14; Multiple authors 585). From the above discussion, you can see clearly that the amount of collaboration in producing research output increases by 0.80 to 1.00.

Collaboration Index

“Collaborative index (Lawani, 1980)¹³ is a mean number of authors per joint paper. For this analysis, we have omitted the single-authored papers which is equal to one always. The mean number of authors per joint authored paper”.

Year	No. of Publications	No of Authors	Collaboration Index
1988	1	2	2.00
1989	1	2	2.00
1990	1	3	3.00
1994	1	2	2.00
1996	1	4	4.00
1997	1	2	2.00
1998	4	11	2.75
1999	3	9	3.00
2000	7	26	3.71
2001	9	34	3.78
2002	6	18	3.00
2003	18	74	4.11
2004	11	41	3.73
2005	11	42	3.82
2006	10	30	3.00
2007	11	36	3.27
2008	17	72	4.24
2009	24	100	4.17
2010	29	138	4.76
2011	37	113	3.05
2012	28	77	2.75
2013	37	134	3.62
2014	52	183	3.52
2015	73	216	2.96
2016	105	301	2.87
2017	64	293	4.58
2018	23	100	4.35
Total	585	2063	

table 6

The collaborative index can be obtained by a total number of authors divided by total number of published articles.

$$CI = \text{Total number of authors} / \text{total number of articles}$$

A study of the data in the aforementioned table, the total number of authors who provided 599 research publications at Bishop Heber College is 2077. Collaboration index is a measure to calculate the number of authors per paper and vary in each year. It is lowest in the year 1988 (2.00) and highest in the year 2010 (4.76). Hence the Bishop Heber College is the priority of group research by the faculty members.

Compound Annual Growth Rate

The formula for the compound annual growth rate can be written as follows:

$$CAGR = \left(\frac{\text{Ending Balance}}{\text{Beginning Balance}} \right)^{\frac{1}{\# \text{Years}}} - 1$$

Ending Value: 599 Beginning Value: 1 No of Years: 20

$$\begin{aligned} CAGR &= (599/1)^{1/20} - 1 \\ &= (599)^{(0.05)} - 1 \\ &= 1.376802 - 1 \end{aligned}$$

The result is .3768 or in percentage 37.68%

Collaborative Institutes

Organizations-Enhanced	Records	Organizations-Enhanced	Records
Bishop Heber College India	599	Research Organization of Information and Systems National Institute of Informatics	8
Bharathidasan University	58	Government Arts College	7
St. Joseph's College Tiruchirapalli	37	National College India	7
Scott Christian College Autonomous	28	Government Arts College	6
National Institute of Technology Tiruchirappalli	22	King Faisal University, Al-Asha	6
Central Electrochemical Research Institute India	19	Vellore Institute of Technology	5
A. Veeriyar Vandayar Memorial Sri Pushpam College Autonomous	19	Trinity College Dublin	5
Alagappa University	15	Madurai Kamaraj University	5
National Taipei University of Technology	12	Cauvery College for Women, Tiruchirapalli	5
Anna University	12	H H The Rajahs College	5
Jamal Mohamed College Autonomous	12	Thanthai Hans Roever College	4
Alagappa Chettiar College of Engineering and Technology	12	Women's Christian College	4
SASTRA University	11	Holy Cross College Autonomous	4
Thiagarajar College of Engineering	10	Swansea University	4
Institute for Numerical Computation and Analysis	9	Nottingham Trent University	4
Brunel University London	8		

table 7

The above *table 7* shows that the Bishop Heber College has published a number of research articles with collaborative institutes and organisation. Overall the BHC has collaboration with 125 Institute and includes many leading Institute from India and abroad.

The Bishop Heber College has the highest number of collaborations with Bharathidasan University, Tiruchirapalli with 58 publications, followed by St. Joseph's College, Tiruchirappalli with 37 publications, Scott Cristian College with 28 publcatons and National Institute of Technology, Tiruchirappalli with 22 publications. Others are Central Electrochemical Research Institute India, A. Veeriya Vandayar Memorial Sripushpam College, Algappa University, Scott Christian College.

Geographical Distribution

Country	Documents	Citations
India	599	2521
Ireland	15	54
United Kingdom	15	72
Taiwan	11	83
Japan	8	85
South Korea	6	3
Qatar	4	6
Germany	3	150
Ethiopia	2	3
Oman	2	0
United States	2	3
China	1	0
Finland	1	0
France	1	23
Greece	1	11
Malaysia	1	0
Saudi Arabia	1	3
Sri Lanka	1	0
Togo	1	6
Uganda	1	0
United Arab Emirates	1	2

table 8

The geographical distribution of contributors is presented in the above table. There are 2063 authors who contributed to the sample total of 599 articles and the collaboration of other 21 countries with the researchers/scholars of Bishop Heber College. The Bishop Heber college highly collaborated with Ireland (15 publications with 54 citations) followed by the United Kingdom with (15 publications with 72 citations).

Most preferred Journals

Source Title	Records
International Journal of Control Theory and Applications	51
Indian Journal of Environmental Protection	40
Journal of Materials Science: Materials in Electronics	25
Ceramics International	12
International Journal of Applied Engineering Research	10
ICIIECS 2015 - 2015 IEEE International Conference on Innovations in Information, Embedded and Communication Systems	10
Asian Journal of Microbiology, Biotechnology and Environmental Sciences	8
Springer Proceedings in Mathematics and Statistics	8
Asian Journal of Chemistry	8

table 9

The faculty members have written in total 242 Scopus listed Indian and foreign journals. Among top ten journals, 51 papers were published with International Journal of Control Theory and Applications is the high productivity journal of Bishop Heber college faculty publications followed by Indian Journals of Environmental protection with 40 publications. The above table presented the presents the top ranking journals during the study period.

The following table lists the top twenty papers with highly cited papers identified for the Bishop Heber college appearing in the Scopus database.

Author	Title	Year	Citation
Moses Ezhil Raj A., Victoria S.G., Jothy V.B., Ravidhas C., Wollschläger J., Suendorf M., Neumann M., Jayachandran M., Sanjeeviraja C.	XRD and XPS characterization of mixed valence Mn ₃ O ₄ hausmannite thin films prepared by chemical spray pyrolysis technique	2010	122
Sabari Girisun T.C., Dhanuskodi S.	Linear and nonlinear optical properties of this thiourea zinc sulphate single crystals	2009	88
Vijayajayanthi M., Kanna T., Lakshmanan M.	Bright-dark solitons and their collisions in mixed N ⁻ -coupled nonlinear Schrödinger equations	2008	85
Sivasankar V., Ramachandramoorthy T., Chandramohan A.	Fluoride removal from water using activated and MnO ₂ -coated Tamarind Fruit (Tamarindus indica) shell: Batch and column studies	2010	45
Ramya M., Anusha B., Kalavathy S., Devilaksmi S.	Biodecolorization and biodegradation of Reactive Blue by Aspergillus sp.	2007	43

Sabari Girisun T.C., Dhanuskodi S., Mangalaraj D., Phillip J.	Synthesis, growth, and characterization of bithiourea zinc bromide for optical limiting applications	2011	41
Manikandan R., Thiagarajan R., Beulaja S., Chindhu S., Mariammal K., Sudhandiran G., Arumugam M.	Anti-cataractogenic effect of curcumin and aminoguanidine against selenium- induced oxidative stress in the eye lens of Wistar rat pups: An in vitro study using isolated lens	2009	40
Barnabas C.G.G., Nagarajan S.	Antimicrobial activity of flavonoids of some medicinal plants	1988	40
Vijayalakshmi K., Karthick K., Gopalakrishna D.	Influence of annealing on the structural, optical and photoluminescence properties of ZnO thin films for enhanced H ₂ sensing application	2013	39
Vijayajayanthi M., Kanna T., Lakshmanan M.	Multisoliton solutions and energy sharing collisions in coupled nonlinear Schrödinger equations with focusing, defocusing and mixed type nonlinearities	2009	31
Latthe S.S., Sudhagar P., Ravidhas C., Jennifer Christy A., David Kirubakaran D., Venkatesh R., Devadoss A., Terashima C., Nakata K., Fujishima A.	Self-cleaning and superhydrophobic CuO coating by jet-nebulizer spray pyrolysis technique	2015	29
Kumar G., Sharmila Banu G., Kannan V., Rajasekara Pandian M.	Antihepatotoxic effect of β -carotene on paracetamol induced hepatic damage in rats	2005	29
Bhaskar A., Vidhya V.G., Ramya M.	Hypoglycemic effect of Mucuna pruriens seed extract on normal and streptozotocin-diabetic rats	2008	28
Raj A.M.E., Agnes V., Bena Jothy V., Ravidhas C., Wollschläger J., Suendorf M., Neumann M., Jayachandran M., Sanjeeviraja C.	Spray deposition and property analysis of anatase phase titania (TiO ₂) nanostructures	2010	27
Ramya M., Anusha B., Kalavathy S.	Decolorization and biodegradation of Indigo carmine by a textile soil isolate Paenibacillus larvae	2008	27
Ravichandran K., Mohan R., Begum N.J., Swaminathan K., Ravidhas C.	Property enhancement of transparent conducting zinc oxide thin films - Effect of simultaneous (Sn+F) doping	2013	25
Kanna T., Vijayajayanthi M., Lakshmanan M.	Coherently coupled bright optical solitons and their collisions	2010	25
Sivasankar V., Ramachandramoorthy T., Darchen A.	Manganese dioxide improves the efficiency of earthenware in fluoride removal from drinking water	2011	23

Vijayalakshmi K., Sivaraj D.	Enhanced antibacterial activity of Cr doped ZnO nanorods synthesized using microwave processing	2015	22
Shabu R., Moses Ezhil Raj A., Sanjeeviraja C., Ravidhas C.	Assessment of CuO thin films for its suitability as window absorbing layer in solar cell fabrications	2015	22

table 10

Findings and Conclusion

This study attempt to investigate the quantitative analysis of the faculty research publications of the Bishop Heber College, Tiruchirapalli. Compared to the past 10 years in the study period, the teacher's research performance has significantly increased. The study concluded based on the following findings

- The study found that, from 1988 to 1997, the publication rate was very minimum and only 6 research papers have published and after 1998 the publication rate is gradually increased. The study found that the highest number of publications in the year 2016 with 110 publications.
- Based on the citation, out of 599 research output, 350 papers are with citations & citation free 249 papers, which indicates that the authors' productivity is innovative and quality output in their research field. In all, 599 publications with 2580 citations and citations per paper are found to be 4.31. It was found that Prof. Jayachandran M having highest average score 7 publications; 176 citations; Average score: 25 is the most prolific author followed by Prof. Ramya M (6 publications; 117 citations; average score: 20).
- In the number of publications Prof. Vijalakshmi K is the most productive author and contributed 49 publications, based on the maximum number of citations Prof. Ravidas is the most prolific author (33 document with 454 citations).
- In document type, 81.47% publication is in the mode of research articles. The study inferred that the authors are more interested to publish as research articles in journals than any other category.
- In case of authorship pattern, Bishop Heber College teachers are engaged in publishing their research papers with two or more authors. The study revealed that the single author's productivity is very low.
- Degree of collaboration in research output of Bishop Heber College. The degree of collaboration is 0.98 during the study period and collaboration in producing research output increases by 0.80 to 1.00.
- In terms of collaboration index, the total number of authors who provided 599 research publications at Bishop Heber College is 2077. It is lowest in the year 1988 (2.00) and highest in the year 2010 (4.76). Hence the Bishop Heber College is the priority of group research by the faculty members.

- The compound annual growth rate is .3768 or in percentage 37.68%.
- The Bishop Heber College has the highest number of collaborations (based institutions) with Bharathidasan University, Tiruchirapalli with 58 publications.
- Bishop Heber College researchers/scholars collaborated (country wise) with 21 countries. The study found that, highly collaborated with Ireland (15 publications with 54 citations) followed by the United Kingdom with (15 publications with 72 citations).
- 51 papers were published with International Journal of Control Theory and Applications is the high productivity journal of Bishop Heber college faculty publications.
- “XRD and XPS characterization of mixed valence Mn₃O₄ hausmannite thin films prepared by chemical spray pyrolysis technique” is the highly cited paper for the Bishop Heber College.

Overall, the Bishop Heber college research is well-cited and published with top ranked journals in the globe. This indicates that the authors' productivity is innovative and increasing quality outputs in their research fields.

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