

Bibliometric Analysis of the Universities Research Journal (2008-2010)

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Abstract

This study focuses a bibliographic analysis of the Universities Research Journal. It covers Volume 1 to Volume 3 published during the period 2008 to 2010. The major focus of this study is to apply bibliometric analysis to analyse the research performance of faculty members in various institutions of the Departments of Higher Education (Lower and Upper Myanmar) under the Ministry of Education. The method of the study is bibliometric analysis which is used to study in detail the bibliographic features of the articles and citation analysis of references. It is a research method used in library and information science. In this study, data are collected from three volumes (22 issues) of the journal covering a particular period. The collected data are tabulated and analysed for making observations. This study shows authorship pattern of articles, subject-wise distribution of articles, institution-wise contribution of articles, institution wise contribution of authors, collaborative country-wise distribution of articles, etc. It will be useful to researchers who pursue research activities in their specific disciplines.

Key words: Bibliometric analysis, citation analysis, subject-wise distribution, institution-wise distribution, collaborative country-wise distribution

Introduction

Information is one of the most important resources for a nation. Nowadays, information has been growing out in an exponential rate. Similarly the periodical publication has also been increasing day by day since the first western scholarly journal titled *Journal des scavans*, started publication in 1665.³ Periodicals are the primary sources of information and important media for communication. They play major role for communicating the latest research findings and publishing the articles containing the current development in any field of knowledge. They are the indicators of literature growth in any field. They emerge as the main channel of transmitting knowledge. Among the periodicals, academic journals are a major medium through which research findings are published. Through publication in such journals, researchers communicate their methodologies and findings. The modern process of scholarly communication relies heavily on books, monographs, and conference proceedings, but most commonly on academic journals.⁴

The primary function of academic journals is to report on original research, making it available to the rest of the scholars within the discipline. They are fundamental to scholarly communication. In addition, the status conferred by publication in highly-rated journals is essential to the career of academics. Through these journals, researchers and academicians can access important information about recent developments in their fields. They are issued by academic communities for a particular purpose or audience. They deal with matters of current interest to groups such as faculty members, researchers, etc. They are the most frequently referred documents among the research scholars and subject experts. This study attempts to evaluate various unexplored facets of Universities Research Journal. It will also be helpful for librarians to plan a better collection development with regard to academic journals.

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³ M. Ornstein, *Role of Scientific Societies in the Seventh Century*; (London : Archon Books, 1963), 308-212.

⁴ R. Olurunsola, "Book Reviews and Professional Development Information: in Local and Foreign Journals." *Middle Belt Journals of Library and Information Science*, 1 (182) (2001) : 113-118.

Bibliometrics

Bibliometrics is a research method used in library and information studies. It is a quantitative study of various aspects of literature on a topic. It has extensive application in identifying the research trends in a subject, trends in an authorship and collaboration in research, core periodicals, obsolescence and dispersion of scientific literature in estimating the comprehensiveness of secondary periodicals, author productivity and impact of research, distribution of scientific publications by universities, citation studies, and so on. This leads to better organization of information resources, which is essential for effective and efficient use. Most of these studies pertain to universities, scientists, disciplines, and documents.

The term "Bibliometrics" was coined by Pritchard in 1969. He defined that bibliometrics is "to shed light on the processes of written communication and of the nature and course of development of a discipline by means of counting and analyzing the various facets of written communication... the application of mathematics and statistical methods to books and other media of communication...".¹ White & McCain defined that "Bibliometrics is the quantitative study of literature as they are reflected in bibliographies. Its task, immodestly enough, is to provide evolutionary models of science, technology, and scholarship".²

Bibliometric study on single journal is a promising area of research. In this study, data is collected from a single journal covering a particular period and vividly analysed from different directions. The findings from such studies provide some interesting and useful facts to researchers, authors, and editors regarding various crucial aspects of scholarly communication of the source journal.

Bibliometrics has been known by other names, such as 'statistical analysis of the literature', "statistical bibliography". In 1948, the great library scientist S.R.Ranganathan coined the term "librametry" which referred to measurement used to streamline library services. "Bibliometrics" is analogous to Ranganathan's librametrics, the Russian concept *scientometrics*, FID's *infometrics* and *subdisciplines like econometrics, psychometrics, sociometrics, biometrics, technometrics, chemometrics, and climetrics*, where mathematics and statistics are applied to study and solve problems in their respective fields. The term "scientometrics" is currently used for the application of quantitative methods to the history of science, and obviously overlaps with bibliometrics to a considerable extent.

Literature Review

There are various research studies highlighting the importance of bibliometric analysis and their application to library management and administration. This type of analysis enables the researcher to identify research gaps in previous studies.

Rangarajan and Bhatnagar (1981) analysed the bibliographic data compiled from Physics Abstracts on research papers published over a period of two decades.

Zainab, Ani and Anur (2009) in their bibliometric study on Malaysian Journal of Computer Science evaluated the article productivity of the journal from 1985 to 2007. The study further revealed authorship, co-authorship pattern by degree authors' collaboration that ranged from 0.25 to 0.95 and journal impact factor of MJCS.

¹ A. Pritchard. "Statistical Bibliography or Bibliometrics?". *Journal of Documentation*. 25 (1969) : 348-349.

² H.D. White. D.K.W. McCain. "Bibliometrics." in *Annual Review of Information Science and Technology*, Vol.24, (Amsterdam, The Netherlands: Elsevier Science Publishers for the American Society for Information Science, 1989). 119-186.

Thanuskodi (2010) conducted a bibliometric analysis of the Journal library Philosophy and Practice from 2005-2009. His findings indicate that the highest number of articles have appeared in the area of computer application in library and information science. He found that the maximum number of contributors are single authors.

Thanuskodi (2011) analysed the bibliometric data compiled from Indian Journal of the Chemistry. This study reveals that maximum number of articles was published in the year 2005. The maximum number of contributors is joint authors. It was found that majority of the authors preferred journals as the sources of information providing the highest number of citations.

Objectives of the Study

The major focus of the present study is to apply bibliometric analysis to analyse the performance of research output of faculty members in various universities and degree colleges of Departments of Higher Education (Lower and Upper Myanmar) under the Ministry of Education.

The study has also been undertaken with the objectives of analyzing the following aspects:

- To make an analysis of articles published in Universities Research Journal
- To identify the number of contributions published during the period of study
- To study the authorship pattern
- To study the subject coverage of articles
- To identify the institution-wise distribution of articles and authors
- To identify collaborative country-wise distribution of articles
- To identify distribution of various forms of documents cited and the average number of references per article
- To determine the status of the Journal
- To encourage faculty members to embark on research project

Methodology

Methodology applied in the present study is bibliometric analysis which is used to study in detail the bibliographic features of the articles and citation analysis of references appended at the end of each article. For this the relevant data are collected and recorded. Then they are tabulated and analysed for making observations.

Universities Research Journal

The Universities Research Journal was initiated under the guidance of the Ministry of Education for partial implementation of the Education Development Plan.

Under this plan, the research programmes are now under implementation at higher education sector in Myanmar with these objectives:

- To conduct research at international level
- To establish research laboratories fully equipped with modern instruments
- To achieve research outcome which are directly beneficial to the development of the nation
- To enhance skills, creativity and capabilities in the performance of research
- To create new generation of outstanding researchers.

Editorial Board members of the this journal are mostly professors, associate professors, researchers, and PhD degree holders who are now serving in various universities, degree colleges and institutions under the Ministry of Education.

The first issue of the Universities Research Journal was published in December, 2008. It was published in six issues, covering Volume 1, No. 1 to Volume 1, No.6. It contains seven major fields and 180 items resulted from the outstanding research projects conducted by faculty members of various universities and degree colleges under the Departments of Higher Education.

The second issue of the Universities Research Journal has been published in December, 2009 covering Volume 2, No.1 to Volume 2, No. 9. It includes 30 major fields and 306 items of endeavour. In December 2010, the third issue of the Universities Research Journal was published comprising Volume 3, No. 1 to Volume3, No.7. It involves 23 major fields and consists of 185 research papers.

This journal aims to lay down firm foundations for the pursuits of the arts and science which are essential for the development of the nation. It is issued yearly. This journal is designed to be used for formally for the students, teachers and researchers under the Ministry of Education and informally for those of the life long learners who are interested in research. It is one of the authoritative journals published in Myanmar.

Data Analysis

The analysis of data from Universities Research Journal for 2008-2010 was done to measure the growth of literature. The literature was analysed to ascertain forms of publication, authorship patterns, subject-wise distribution, and institution-wise performance and to identify various forms of documents cited.

Number of Articles

A total number of 671 articles published during the period 2008-2010 have been recorded for the present study.

Table 1. Year-wise distribution of articles

Year	Vol. No.	No. of Issues	No. of Contribution	Percentage
2008	1	6	180	26.83
2009	2	9	306	45.60
2010	3	7	185	27.57
Total		22	671	100.00

The above table shows that maximum number of articles were published in the year 2009 (306) and minimum in 2008 (180) articles. The journal publishes on an average of 224 articles per year.

Subject Distribution of Articles

Table 2. Subject-wise distribution of articles

Sr. no.	Subject	No. of Articles	Percentage
1	Myanmar	39	5.81
2	English	25	3.73
3	Geography	6	0.89
4	History	10	1.49
5	Philosophy	33	4.92
6	Psychology	17	2.53
7	International Relations	7	1.04
8	Law	9	1.34
9	Oriental Studies	22	3.28
10	Archaeology	5	0.75
11	Anthropology	4	0.60
12	Economics	12	1.79
13	Statistics	3	0.45
14	Commerce	4	0.60
15	Management Studies	4	0.60
16	Physics	70	10.43
17	Chemistry	76	11.32
18	Zoology	95	14.15
19	Botany	82	12.22
20	Mathematics	39	5.81
21	Geology	48	7.15
22	Computer Studies	6	0.8
23	Industrial Chemistry	9	1.34
24	Nuclear Physics	1	0.15
25	Marine Science	13	1.94
26	Chinese Language	1	0.15
27	French Language	3	0.45
28	Russian Language	2	0.30
29	Japanese Language	2	0.30
30	Thai Language	2	0.30
31	German Language	2	0.30
32	Linguistics	6	0.89
33	Educational Theory	4	0.60
34	Educational Psychology	7	1.04
35	Methodology	3	0.45
Total		671	100.00

Table 2 shows that contribution of articles covered 35 fields of knowledge. Among them, the majority of contributions appeared under Zoology 95 (14.15%). The next position was taken by Botany 82 (12.22%). This was followed by Chemistry 73 (11.32%) and Physics 70 (10.45%).

Authorship Pattern

Table 3. Authorship pattern

Year	Number of Authors					Total
	1	2	3	4	5 & more	
2008	111	25	35	6	3	180
2009	183	54	56	8	5	306
2010	108	42	27	7	1	182
Total	402	121	118	21	9	671
Percentage	59.91	18.03	17.59	3.13	1.34	100.00

Table 3 reveals the authorship pattern of the articles published under the period of study. Maximum number of articles was contributed by single authors 402 (59.91%). This was followed by two authors with 121 (18.03%), three authors with 118 (17.59%), four authors with 21 (3.13%) and five and more authors with 9 (1.34%) of the total articles.

Year-wise Authorship Pattern

Table 4. Year-wise authorship pattern

Authorship	Year			Total	Percentage
	2008	2009	2010		
Single	111	183	108	402	59.91
Joint	69	123	77	269	40.09
Total	180	306	185	671	100.00

The above table shows that out of 671 articles, the highest number of articles 402 (59.91%) were contributed by single authors while joint authors contributed 269 (40.09%) articles. Therefore, it is deduced that the publication output of Universities Research Journal was dominated by single authors throughout the publication phase of 2008-2010.

Institution-wise Contribution

Table 5. Institution-wise contribution of articles

Sr. No.	Name of Institution	Contribution of Articles			Total	Percentage
		2008	2009	2010		
1	University of Yangon	27	60	27	114	14.79
2	Yangon Institute of Economics	4	8	1	13	1.69
3	Yangon Institute of Education	10	9	2	21	2.72
4	Yangon University of Distance Education	3	13	8	24	3.11
5	Dagon University	10	43	24	77	9.98
6	Yangon University of Foreign Languages	5	10	5	20	2.59
7	East Yangon University	3	11	7	21	2.72
8	West Yangon University	10	14	7	31	4.02
9	Pyay University	7	7	4	18	2.33
10	Taungoo University	4	4	8	16	2.08
11	Maubin University	2	7	4	13	1.69
12	Hinthada University	6	8	10	24	3.11
13	Mawlamyine University	12	13	6	31	4.02
14	Patheingyi University	11	7	8	26	3.37
15	Sittway University	4	5	3	12	1.56
16	Hpa-an University	4	1	3	8	1.04
17	Dawei University	3	4	1	8	1.04
18	Myeik University	3	1	2	6	0.78
19	Bago Degree College	1	2	4	7	0.91
20	National Management College	-	1	1	2	0.26
21	University of Mandalay	13	29	23	65	8.43
22	Yadanabon University	10	16	9	35	4.54
23	Sagaing Institute of Education	-	2	-	2	0.26
24	Mandalay University of Foreign Languages	3	2	2	7	0.91
25	Mandalay University of Distance Education	2	5	2	9	1.17
26	Kyaukse University	2	11	10	23	2.98
27	Magway University	4	5	8	17	2.20
28	Monywa University	6	3	2	11	1.42
29	Monywa Institute of Economics	2	3	1	6	0.78
30	Myitkyina University	-	3	3	6	0.78
31	Meiktila University	2	4	3	9	1.17
32	Meiktila Institute of Economics	6	3	2	11	1.42
33	Taunggyi University	2	3	3	8	1.04
34	Lashio University	7	4	-	11	1.42
35	Panglong University	3	3	2	8	1.04
36	Kyaington University	2	2	3	7	0.91
37	Liokaw University	3	4	1	8	1.04
38	Bhamo University	2	-	-	2	0.26
39	Pakokku University	-	3	4	7	0.91
40	Kalay University	1	3	2	6	0.78
41	Shwebo University	1	-	3	4	0.52
42	Yenanchaung Degree College	2	4	-	6	0.78
43	Myinchan Degree College	4	3	-	7	0.91
44	Mohnyin Degree College	-	3	1	4	0.52
Total		206	346	219	771	100.00

An attempt has been made to analyse the research contributions of various institutions under the Ministry of Education. Table 5 reveals that 771 contributions were conducted by forty-four universities and degree colleges according to institution-wise pattern. It was because some were collaborative work of different universities and degree colleges. The highest number of papers was 114 (14.79%) by University of Yangon. This was followed by Dagon University 77 (9.98%), University of Mandalay 65 (8.43%) and Yadanabon University 35 (4.54%). Moreover, it can be seen that the minimum number of paper was 2 (0.26%). It was contributed by Sagaing Institute of Education, University of Bhamo and National Management College.

Institution-wise Contribution of Authors

Table 6. Institution-wise contribution of authors

Sr. No.	Name of Institution	No. of Authors			Total	Percentage
		2008	2009	2010		
1	University of Yangon	33	101	38	172	15.68
2	Yangon Institute of Economics	3	8	1	12	1.09
3	Yangon Institute of Education	15	18	2	35	3.19
4	Yangon University of Distance Education	3	17	9	29	2.64
5	Dagon University	16	64	31	111	10.12
6	Yangon University of Foreign Languages	7	14	5	26	2.37
7	East Yangon University	9	17	9	35	3.19
8	West Yangon University	16	15	10	41	3.74
9	Pyay University	7	7	7	21	1.91
10	Taungoo University	9	9	14	32	2.92
11	Maubin University	5	9	4	18	1.64
12	Hinthada University	6	10	13	29	2.64
13	Mawlamyine University	17	23	10	50	4.56
14	Patheingyi University	18	11	11	40	3.65
15	Sittway University	6	5	4	15	1.37
16	Hpa-an University	4	1	4	9	0.82
17	Dawei University	6	4	1	11	1.00
18	Myeik University	3	1	2	6	0.55
19	Bago University	3	2	9	14	1.28
20	National Management College	-	1	1	2	0.18
21	University of Mandalay	17	44	34	95	8.66
22	Yadanabon University	13	20	13	46	4.19
23	Sagaing Institute of Education	-	2	-	2	0.18
24	Mandalay University of Foreign Languages	3	2	2	7	0.64
25	Mandalay University of Distance Education	4	5	2	11	1.00
26	Kyaukse University	2	18	12	32	2.92
27	Magway University	8	7	8	23	2.10
28	Monywa University	8	3	2	13	1.19
29	Monywa Institute of Economics	4	7	1	12	1.09
30	Myittha University	-	4	3	7	0.64
31	Meiktila University	5	7	3	15	1.37
32	Meiktila Institute of Economics	10	3	5	18	1.64
33	Taunggyi University	2	3	3	8	0.73
34	Lashio University	10	6	-	16	1.46
35	Panglong University	3	3	2	8	0.73
36	Kyaington University	3	3	3	9	0.82
37	Liokaw University	7	9	5	21	1.91
38	Bhamo University	2	-	-	2	0.18
39	Pakokku University	-	3	8	11	1.00
40	Kafay University	2	4	2	8	0.73
41	Shwabo University	1	-	3	4	0.36
42	Yenanchaung Degree College	2	4	-	6	0.55
43	Myinchan Degree College	6	4	-	10	0.91
44	Mohyin Degree College	-	3	2	5	0.46
	Total	298	501	298	1097	100.00

Table 6 reveals that the articles have been emanated by 1097 authors from 44 universities and degree colleges. The analysis shows that the highest numbers of contributors belong to University of Yangon 172 (15.68%), followed by Dagon University 111 (10.12%), University of Mandalay 95 (8.66%) and Yadanabon University 46 (4.19%) during the period 2008 to 2010.

Collaborative Country-wise Distribution

Table 7. Collaborative country-wise distribution of articles

Country	No. of Articles			Total	Percentage
	2008	2009	2010		
Myanmar	174	298	184	656	97.76
India	2	2	1	5	0.75
Japan	1	1	-	2	0.30
Thailand	1	-	-	1	0.15
Germany	2	2	-	4	0.59
Israel	-	2	-	2	0.30
Switzerland	-	1	-	1	0.15
Total	180	306	185	671	100.00

As shown in Table 7, 671 research articles were collaborated with faculty members from Myanmar and other foreign countries, such as India, Japan, Thailand, Germany, Israel and Switzerland. Majority of the contributions were from Myanmar with 656 (97.7%). The highest number of collaborative work was with India (5, 0.75%), followed by Germany (4, 0.59%).

Length of Articles

Table 8. Length of articles

Pages	Year			Total	Percentage
	2008	2009	2010		
1-5	4	5	3	12	1.79
6-10	70	122	57	249	37.11
11-15	69	127	85	281	41.88
16-20	34	41	31	106	15.80
20 & more	3	11	9	23	3.42
Total	180	306	185	671	100.00

Table 8 reveals that the majority of articles 281 (41.88%) have the length of 11-15 pages followed by 249 (37.11%) articles with 6-10 pages, 106 (15.80%) articles with 16-20 pages, and 23 (3.42%) articles with 20 and more pages. The remaining 12 (1.79%) articles have the length of 1-5 pages.

Language-wise Distribution

Table 9. Language-wise distribution of articles

Language	No. of Articles			Total	Percentage
	2008	2009	2010		
English	168	278	171	617	91.95
English & Myanmar	8	25	14	47	7.00
English & French	2	-	-	2	0.30
English & Chinese	1	-	-	1	0.15
English & Russian	1	1	-	2	0.30
English & Thai	-	2	-	2	0.30
Total	180	308	185	671	100.00

It is evident from Table 9 that majority of the articles were written in English with 617 (91.95%). Others were written in both English and Myanmar (47, 7.00%), English and French (2, 0.30%), English and Russian (2, 0.30%), English and Thai (2, 0.30%) and English and Chinese (1, 0.15%).

Forms of Documents Cited

Distribution of various forms of cited documents are given in the following table. They include journals, books, reference books, seminar/conference proceedings, etc.

Table 10. Forms of documents cited

Forms of Document	Total No. Citation			Total	Percentage
	2008	2009	2010		
Journals	442	662	546	1650	24.11
Books	843	1788	849	3480	50.84
Reference Books	164	238	351	753	11.00
Journals	442	662	546	1650	24.11
Books	843	1788	849	3480	50.84
Reference Books	164	238	351	753	11.00
Seminar/Conference Proceedings	68	188	56	312	4.56
Dissertations	95	178	153	426	6.22
Websites	34	95	81	210	3.07
Interviews	-	14	-	14	0.20
Total	1646	3163	2036	6845	100.00

The authors of the Universities Research Journal were found to use various resources for their research. Table 10 elicits that majority of the contributors preferred books as the source of information which occupied the top position with the highest number of citations (3480, 50.84%) of the total 6845 citations. The journal articles occupied the second position with 1650 (24.11%) citations. It was followed by reference books (753, 11.00%) citations and dissertations (426, 6.22%) citations. Concurrently, use of conference proceedings (312, 4.56%) citations, web resources (210, 3.07%) and interviews (14, 0.20%) citations were found relatively less. Moreover, it was found that the average number of cited document per article was 10.

Findings

The present study has been undertaken to assess the research performance of faculty members from various institutions under the Ministry of Education. The findings of the present study lead to the following observations.

1. The study reveals that the publication of articles in Universities Research Journal has witnessed an increasing trend from 2008 to 2010.
2. The analysis reflects that the largest number of publications was 306 in 2009.
3. It is deduced that the publication output of Universities Research Journal was dominated by single authors throughout the publication phase of 2008 to 2010.
4. The present study elicits that the highest number of articles have appeared in the area of Zoology, followed by Botany, Chemistry, and Physics. But, all the articles generally cover various fields of subjects in higher learning.
5. University of Yangon occupied the first place among the institutions, with 114 publications during the study period followed by Dagon University with 77 publications, University of Mandalay with 65 publications and Yadanabon University 35 publications.
6. During the period 2008-2010, 671 articles were contributed by 1097 authors from 44 universities and degree colleges under the Ministry of Education.
7. The analysis shows that the highest numbers of contributors belong to University of Yangon, followed by Dagon University, University of Mandalay and Yadanabon University.
8. Researchers have good relationships with various countries, including India, Japan, Germany, Israel, Thailand, and Switzerland in this journal.
9. Books are found to be the most frequently cited materials followed by journal articles, reference books and dissertations.
10. The maximum number of contributions has the length of 11-15 pages.

The findings of the present study lead to the following recommendations:

1. More infrastructural facilities should be provided to institutions for promoting research activities.
2. Special training programmes in local or foreign are needed to help faculty members to pursue research activities on par with world output.
3. There is a need for incentives and awards to eminent and outstanding faculty members according to their contribution to the growth of research and development of the discipline.
4. There is a need to encourage faculty members to embark on research projects in their respective disciplines.
5. There is a need to encourage collaborative research activities with researchers in other foreign countries.
6. Libraries should be stocked with relevant and current literature to support.
7. Librarians in institutions of higher learning should make the case to administrators for the acquisition of current scholarly journals.

Conclusion

Bibliometric study of a single journal provides a portrait of the concerned journal by indicating the quality, maturity and productivity of the journal. It informs about the research orientation that the journal supports to disseminate and its influence on author's choice as a channel to communicate or retrieve information for their research needs (Zainab *et al.*, 2009). In this regards, Universities Research Journal from 2008 to 2010 was analysed with requisite bibliometric measures. The findings indicate that the journal play a significant role among the academicians. It is one of the most leading journals in the higher learning. In this short period 2008-2010, the journal has tried to keep up its main aim of acting as a medium for communication of all sorts of information to librarians, scientists, and academicians. It is hoped that Universities Research Journal will solicit more scholarly contributions from more number of researchers from various institutions in higher learning.

Acknowledgements

We would like to express our heartfelt gratitude to Rector Dr. Khin Maung Oo and Pro-Rector Dr. Si Si Hla Bu, Yadanabon University for their interest and encouragement on the research work. We are greatly indebted to all the teachers of the Department of Library and Information Studies, Yadanabon University who willingly help us in collection of the required data from the Universities Research Journal to complete this research in time.

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