

Pattern of Collaborative Research on Malaysian Journal of Library and Information Science: A Scientometric Profile

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Abstract - An attempt has been made to analyze all the scientific research articles contributed by authors in the Malaysian Journal of Library and Information Science for the period between 2008 and 2014. Total of 142 articles, 19.71% were maximum number of papers had been published in the year 2011 and 9.86% were the minimum number of papers in 2014. The study investigated the rank wise distributions of contribution in which the majority of 31.84 % contributions from Malaysia which is the first position and followed by 11.31% were contributed by Iran is the second rank and 11.01% of contributions came from India is the third position and 7.15% of contributions came from China etc. and the tools such as Degree of Collaboration (DC), Collaborative Index (CI), Annual Growth Rate (AGR), were used to analyze the data and interpretation for the purposes.

Key Words: Malaysia, Library Science, collaborative research, publication, author productivity.

1. INTRODUCTION

In 1969, Pritchard and Nalimo initiated the two terms together such as Bibliometrics and Scientometrics. The earlier one described like “the application of mathematical and statistical methods to books and other media of communication” and the later one expressed as “the application of quantitative methods which are dealing with the analysis of science viewed as an information process”. As per the above definitions, the earlier is generally considered to manage and process information materials such as books, review articles, scientific papers etc and the later one is constrained to evaluate and determine the outputs of only science field.

2. SOURCE JOURNAL

The Malaysian Journal of Library and Information Science is one of the international leading journals in the field of LIS which has been taken into consideration for the present study. This journal is started to publish as three times a year since 2009 by the Faculty of Computer Science and Information Technology, University of Malaysia. In The electronic version is also available <http://ejum.fsktm.um.edu.my>. This publication was published in print as well as electronic during the period between 1996 and 2008. But, from the year 2009 onwards, it has been published via electronic form and indexed and abstracted by various databases.

3. RELATED WORK

A collaborative research trend is a well – renowned attribute of contemporary science, and there has been a reliable trend towards increased collaboration in all branches of science in the recent century. The main reason for collaborative research can be pointed out to the interdisciplinary nature of examinations and investigations, increasing cost of infrastructures, laboratory facilities and general interest of scientists in the same field. A huge number of statistical and mathematical analysis have previously done to scrutinize and interpret the research comprehensive approach of collaborative authorship not only library and information science but also in different disciplines.

Hawkins (2001) investigated bibliometric study on electronic publications in information science in 2001. The findings of the study revealed that the twenty eight published articles were identified and ranked on the subject wise. It was found that the information science papers in electronic journals started in 1990 and the prolific authors were identified

and the majority of contributors found from USA and UK. Velmurugan (2013) investigated the research output of two hundred and three research papers of Annals of Library and Information Studies journal select 6 years during 2007 and 2012. The findings of the study revealed that the maximum number 43.35% of articles produced by double authors.

Gupta and Bala (2013) have studied the scientific research on Glaucoma of Indian publications output for the period between 2002 and 2011. Results showed that 1078 publication output taken into account for study. The average citation impact registered per paper in which 3.03 during 2002-2011 and decreased from 3.87% during 2002-2006 to 2.49% during 2007 to 2011 and the international collaborative share of India in overall research was 21.06% during the period 2002-2011, which was increased from 17.92% in 2002-2006 to 23.09% during 2007-2011.

Falagas, Papastamataki and Bliziotis (2006) have evaluated publication output on parasitology by different parts of the world using PubMed database during the year 1995-2003. The results of the study showed that the research trends in connection with gross domestic product, national income and population of each region. Velmurugan (2013) has studied to examine publication study on Intellectual Property Rights Journal during 2007 -2012. The study explored the collaborative research work, literature trends, citation trends and other features during the period of study. He, Luo and Lu (2009) have investigated on biological invasion research articles using WOS for the duration of 1991 and 2006. The study analysis revealed that the maximum number of research productivity in country wise were USA.

Velmurugan (2014) has explored the research trends in IJPAP. The study analyzed with five hundred and forty six research articles produced and selected four years between January 2009 and December 2012. The findings of the results revealed which the maximum quantity of publications 149 (27.29 %) have been contributed by 2012 and 121 (22.17 %) the least quantity were contributed by 2011. The uppermost quantity of author outputs 420 (6.56) contributed in 2010. Li et al. (2014) discussed in their paper entitled, 'A Bibliometric analysis on Acidophilic Microorganism in recent 30 years' in the year 2014. The results found

and evaluated the scientific productivity and trends on acidophilic organism and found that the studies in acidophilic microorganism growth rate increased drastically and also notified seven industrialized countries and four highly developing countries were listed in top 20 most productive countries that recommended financial setting were significant effect on educational growth.

Velmurugan and Radhakrishnan (2014) have investigated research trends on the journal namely IETE Technical Review for the year 2007 and 2012 by way of scientometric analysis in which various parameters covered such as authorship pattern, degree of collaboration, relative growth rate and doubling time and also geographical wise distribution of contributions and the findings revealed that the relative growth rate had increased from 2007 to 2012 (i.e. 0.76 to 1.96) and the doubling time had somewhat decreased as measured chronology wise.

Arya and Sharma (2011) have analyzed the authorship research and collaborative work in the field of veterinary science throughout the global particularly in India for period of five years. The collected data were evaluated using database CABI Abstracts. It was found that the study of collaborative research was private and also found based on the subject and results. Chang (2009) used the bibliometric techniques in his paper during the period between 1981 and 2005. For data analysis, 1869 articles had considered in which 3, 422 frequencies of authorship in JASIST during the

time of study. Results showed that the Japanese scientists were eager to carry out their research work individually and also collaborated their colleagues in the same country.

Tiew, Abrizah and Kiran (2002) have analyzed on Malaysian journal of Library and Information science for period 1996 and 2000 and found the results that the average number of references per paper was 22.5 and length per paper was 41.2 pages and the most prolific authors contributed only 12 articles. Then, Bakri and Willett (2008) have explored study on Malaysian Journal of Library and Information Science during the year 2001 and 2006. The findings of the study revealed that fourteen percentages of the MJLIS journal papers had been cited atleast once. An attempt has been made to determine the bibliometric / scientometric techniques to work on MJLIS to determine the authorship pattern and collaborative research trends during the period of study between 2008 and 2014.

4.OBJECTIVES

This study aims to explore the MJLIS publications based on the following purposes to:

- calculate research articles of MJLIS
- observe the productivity of authors of MJLIS
- notice chronology wise authorship pattern of MJLIS
- examine the authors collaboration of MJLIS
- determine the DC of MJLIS
- measure Collaborative Index of MJLIS
- find out the global wise scientific publications of MJLIS
- discover cited journals of MJLIS

5.RESEARCH PROCEDURE

Initially, researchers have collected the secondary data from the related information sources such as subject books, print as well as electronic journals and conference proceedings on Scientometric. Another step, researchers have downloaded the required data gathered from the website of MJLIS for making necessary observations. The bibliometric statistical techniques such as Collaborative Index (CI) and Annual Growth Rate (AGR) were used so as to retrieve the appropriate results. This journal was first published in 1996 and available online in the year 1999 onwards. It publishes original research papers covers emerging areas and for the present study has restricted to only 142 research papers published from 2008 to 2014.

6. COVERAGE

The range of study includes Bibliometrics / Scientometric Studies, Librarianship related subjects, User Studies, Information Sources and Services, Digital Libraries, LIS Education, Academic Libraries, Webology and Internet based studies, Collection Development, Information Literacy, School and Children Libraries, Libraries and Information Professionals, Information Retrieval, Information Management, Legal Issues in LIS, Public Libraries, Special Libraries, Library Historiography, Knowledge Management and e-Commerce. Key viewers of this journal are academicians, scientists, scholars, researchers, LIS Faculty members, information professionals, decision makers, policy makers, and sponsors in the areas of information science and so on.

7. SIGNIFICANCE OF THE STUDY

In any filed the professional developments of a nation which can be estimated and determined by way of literature produced in that field. This analysis has reviewed about bibliometric or scientometric analysis uses in the particular journal and shows how the quantitative methods have been used for data scrutiny to solve various issues such as author productivity, authorship pattern of single and multi-authors, geographical area wise distributions, and citation etc. This study gives the detailed review of bibliometric studies conducted in MJLIS.

8. RESULTS & DISCUSSIONS

8.1. ANNUAL GROWTH RATE (AGR)

In any filed, the growth rate is vital role to measure the impact of publications in a particular discipline to identify the annual increase or decrease. Here, the Annual Growth Rate has been determined to know about the research articles growth level as per the formula given below.

$$AGR = \frac{\text{End Value} - \text{First Value}}{\text{First Value}} * 100$$

In our study, researchers tried to find out the annual growth rate of MJLIS and the results revealed that the End Value was 18 in the year 2009 and the First Value was 16 in the year 2008 and the Annual Growth Rate was 12.5 in the year 2009. Table 1 provides the AGR of the number of research articles for period between 2008 and 2014.

Table 1: AGR of research articles

Year	Volume	Total No. of Articles	AGR %
2008	13	16	-
2009	14	18	12.5
2010	15	24	33.33
2011	16	28	16.67
2012	17	20	-28.57
2013	18	22	10.0
2014	19	14	-36.36

It shows that the year on change in the number of documents was 12.5% in 2009, 33.33% over the respective next year. It indicates that the negative change of -28.57% in 2012 and an increase of 33.33% in the year 2010. The average AGR is 1.2617%.

8.2. AUTHORSHIP PATTERN

The concept of authorship pattern quantities evolved over the course of 20th century by means of a steady increase in collaboration. Authors are contributed a number of scholarly publications in terms of pattern of authors is a part of any scientometric / bibliometric analysis. In this study, Researchers examined authorship pattern of their research articles and found the results were revealed in which maximum publications were published by

Table 2: Authorship pattern

Pattern	Total No of Contributions	Cumulative Value	Percentage
Single Author	35	35	24.65
Double Authors	56	112	39.44
Three Authors	33	99	23.24
Four Authors	11	44	7.74
Five Authors	3	15	2.11
More than Five Authors	4	31	2.82
Total	142	336	100.0

double authors 56 (39.44%) and followed by single author 35. The minimum number of contributions was published by five authors i.e. 3 (2.11%). The analysis depicts that multi-authors are predominant than solo author. The pattern of authorship indicates a remarkable variation among solo author as well as multiple authors. It was observed that very less number of articles was written by single author and the revealed that collaborative research and team work is favored in MJLIS Publication (Table 2 Figure 1).

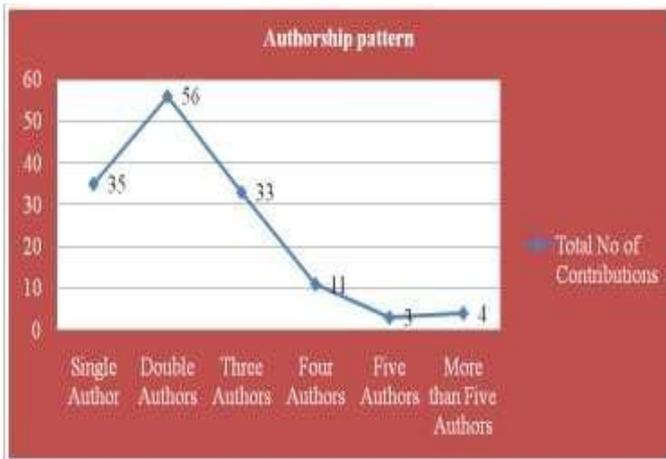


Figure 1: Authorship pattern

8.3.SINGLE Vs CO AUTHORSHIP CONTRIBUTIONS

Collaborative research work or team work or group work will achieve the real goal of any institution or organization. In such a way, Researchers have noticed from the present study in term of single and co-authorship contributions. The highest quantity 75.36% of papers were by joint authors and the rest of 28 (24.64%) contributions were by single author (Table 3 Figure 2).

Table 3: Single and Co-Authorship Contributions

Pattern	Year							No of Articles	Percentage
	2008	2009	2010	2011	2012	2013	2014		
Single	6	9	4	3	6	4	3	35	24.64
Co-Authorship	10	9	20	25	14	18	11	107	75.36
Total	16	18	24	28	20	22	14	142	100.0

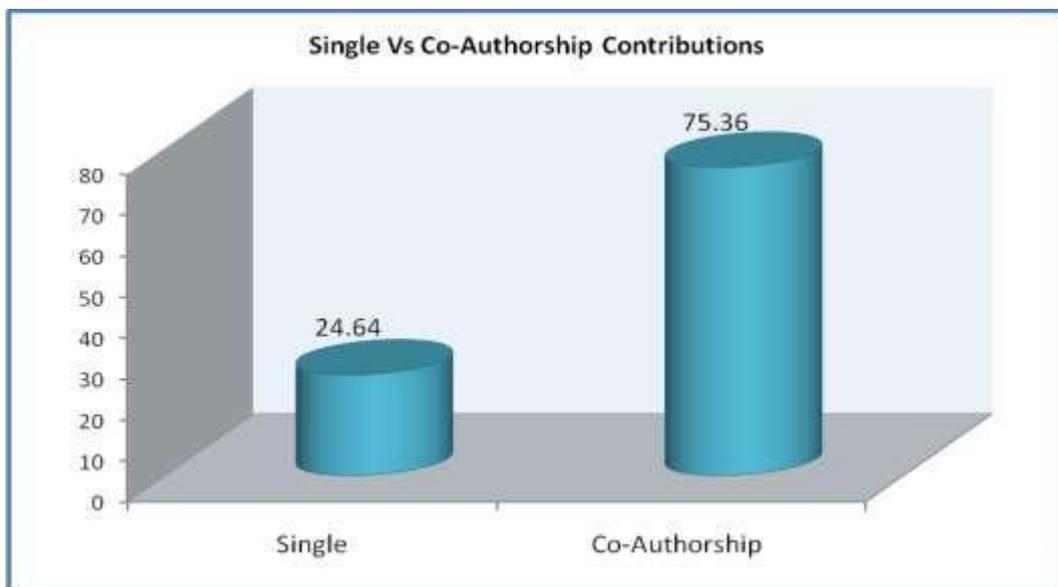


Figure 2: Single and Co-Authorship Contributions

8.4.AUTHORSHIP PRODUCTIVITY

It can be observed from the Table 4 represents that only 2.36 were the average quantity of authors in each article

whereas 0.42 were normal productivity for each contributor. 74 (2.64) were the maximum quantity of author output in 2011.

Table 4: Author Productivity

S. No	Year	Total no. of Articles	No. of Authors	AAPP*	Productivity per year
1	2008	16	27	1.68	0.59
2	2009	18	37	2.06	0.48
3	2010	24	52	2.17	0.46
4	2011	28	74	2.64	0.37
5	2012	20	57	2.85	0.35
6	2013	22	57	2.59	0.38
7	2014	14	32	2.28	0.43
Total		142	336	2.36	0.42

The

*Average Authors per Paper (AAPP) = Number of authors/ Number of papers. Productivity per author= Number of papers/ Number of authors.

percapita publications = No. of items / No. of Authors =142/107 = 1.32

The percapita publication works out to 1.32

8.5.SINGLE Vs MULTI- AUTHORED PAPERS (YEAR-WISE)

Table 5: Year wise Single and Multi Authored Papers

Sl. No.	Year	Single Authored		Multi Authored		Total	% of Records
		Papers	%	Papers	%		
1	2008	6	17.14	10	9.35	16	11.26
2	2009	9	25.72	9	8.41	18	12.68
3	2010	4	11.43	20	18.69	24	16.91
4	2011	3	8.57	25	23.36	28	19.71
5	2012	6	17.14	14	13.08	20	14.09
6	2013	4	11.43	18	16.82	22	15.49
7	2014	3	8.57	11	10.29	14	9.86
Total		35	100.0	107	100.0	142	100.0

Table 5 represents the data about the single and multi-authored papers. A total of 35 papers (24.64%) have been contributed by single author and 107 contributions (75.36%) by multiple authors. It is observed that the maximum amount of offerings made by multi authored papers.

8.6.DEGREE OF COLLABORATION

DC is calculated when the relative amount of joint authors publications to the entire articles in the subjects for the period of time. The formula suggested by Mr. Subramaniam is used. It is expressed as:

Where, C – is the degree of collaboration in a discipline

Nm - is the number of multi-authored research papers in the discipline published during a year

Ns - is the number of single authored papers in the discipline published during the same year. Using this formula, the Degree of Collaboration (DC) is determined.

Table 6: Degree of Collaboration

Year	Single Authored	Multi Authored	Total Output	Collaboration
2008	6	10	16	0.625
2009	9	9	18	0.50
2010	4	20	24	0.83
2011	3	25	28	0.89
2012	6	14	20	0.70
2013	4	18	22	0.18
2014	3	11	14	0.78
Total	35	107	142	0.75

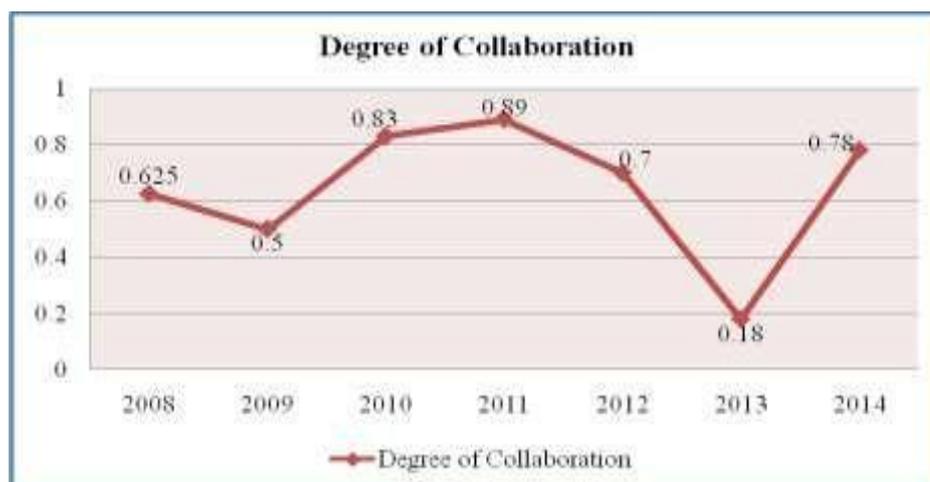


Figure 3: Degree of Collaboration

The formula is where,

C= Degree of Collaboration
 Nm = Number of multiple authors,
 Ns = Number of single authors

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

$$C = 107$$

$$107 + 35 = 142$$

In the present study the value of C is
C = 0.75

Hence, the DC in MJLIS is 0.75. The distribution of degree of collaboration from 2008 to 2014 is presented in table 7. The same research had been done by Amsaveni and Vasanthi (2013) found that the DC value was 0.95 as a whole and the collaborative trends were high.

8.7. COLLABORATION INDEX (CI)

Collaboration index in short CI is one of the tools to measure author productivity. For this method, we have taken only multi-authored papers and avoided mean number of authors per joint paper. Hence, the formula has been used to determine the same as given below.

Table 7: Collaborative Index of Articles

Year	Multi Authored Papers	Total Authors of Multi Authored Papers	Collaboration Index (CI)
2008	10	19	1.90
2009	9	18	2.0
2010	20	24	1.20
2011	25	28	1.12
2012	14	20	1.42
2013	4	18	4.5
2014	3	11	3.67
Total	35	107	3.05

$$CI = \frac{\text{Total Authors}}{\text{Total Joint Papers}}$$

Table 7 provides the year wise mean number of authors per joint authored paper. CI ranges from 1.12 (2008) to 4.5 (2013) with an average of 3.05 per joint authored paper.

8.8. COUNTRY WISE DISTRIBUTION

Table 8 Figure 4 explains that, a study of 336 contributions made and the majority of 31.84 % contributions from Malaysia which is the first position and followed by 11.31% were contributed by Iran is the second rank and 11.01% of contributions came from

India is the third position and 7.15% of contributions came from China and 6.84% from Taiwan; 5.35% from Singapore; 4.76% from Thailand; 3.27% from Nigeria; 2.97% from Pakistan; 2.08% from Bangladesh and United Kingdom; 1.78% from Belgium and Kuwait; 1.19% from Jordan; 0.90% from Botswana, Indonesia, South Korea and USA; 0.59% from Turkey; 0.30% from Kenya, Spain, Sri Lanka, Sudan, Czech Republic, Poland, Rajasthan and Yemen. However, it is inferred that out of above mentioned twenty seven countries, Malaysia gives priority for research compared with other countries.

Table 8: Country wise Distribution

Rank	Country	No of Articles	% of Records
1	Malaysia	107	31.84
2	Iran	38	11.31
3	India	37	11.01
4	China	24	7.15
5	Taiwan	23	6.84
6	Singapore	18	5.35
7	Thailand	16	4.76
8	Nigeria	11	3.27
9	Pakistan	10	2.97
10	Bangladesh	7	2.08
10	UK	7	2.08
11	Belgium	6	1.78
11	Kuwait	6	1.78
12	Jordan	4	1.19
13	Botswana	3	0.90
13	Indonesia	3	0.90
13	South Korea	3	0.90
13	United States	3	0.90
14	Turkey	2	0.59
15	Kenya	1	0.30
15	Spain	1	0.30
15	Sri Lanka	1	0.30
15	Sudan	1	0.30
15	Yemen	1	0.30
15	Rajasthan	1	0.30
15	Poland	1	0.30
15	Czech Republic	1	0.30

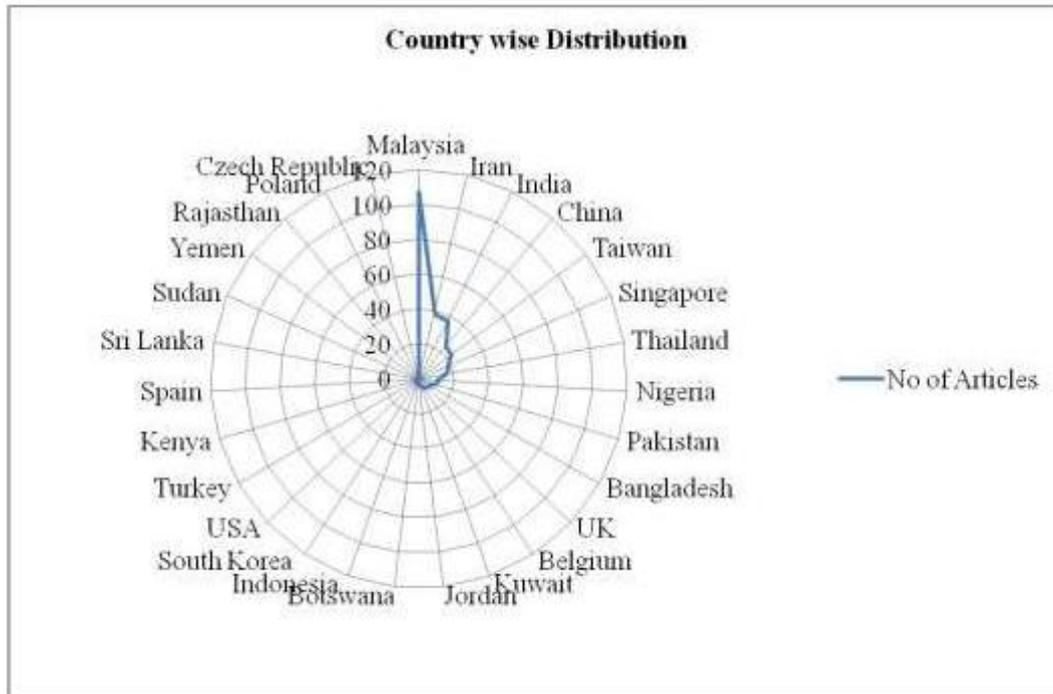


Figure 4: Country wise Distribution

8.9.CONTRIBUTIONS OF CITATION (YEAR - WISE)

Table 9: Contributions of Citations

Year	2008	2009	2010	2011	2012	2013	2014	Total	Average
Citations	395	555	826	817	618	584	494	4289	612.71
Percentage	9.20	12.94	19.25	19.06	14.41	13.62	11.52	100	

Table 9 Figure 5 represents the year wise numbers of references that authors cited in their articles. There were 142 articles with total 4, 289 references during the period between 2008 and 2014 and shows that the distribution of citations by volumes in 2010 indicates

which greatest number of citations were 826 (19.25%) whereas the least amount of citations were 395 (9.20%) in the year 2008.

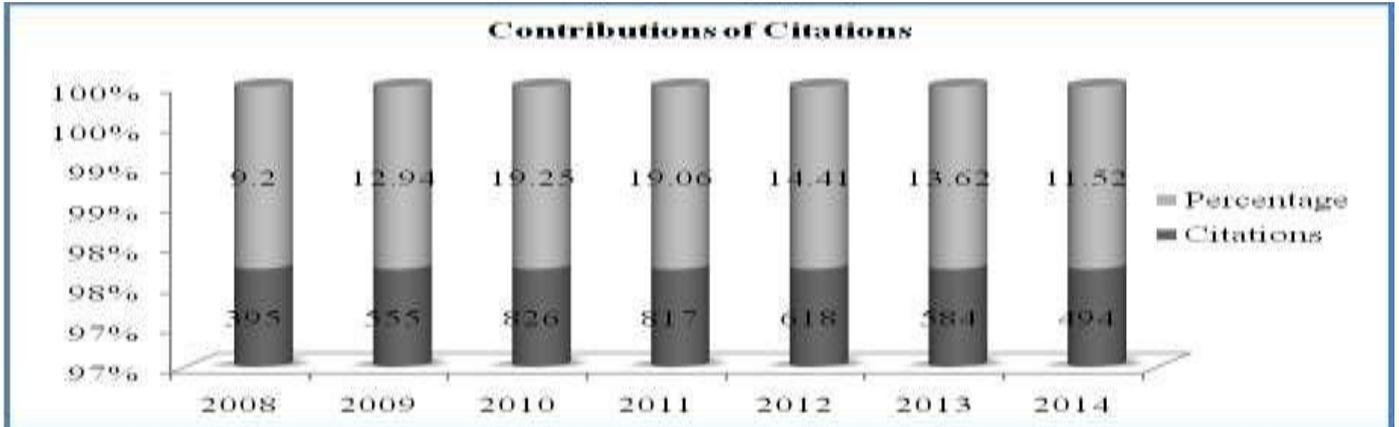


Figure 5: Contributions of Citations

8.10.DISTRIBUTION OF CONTRIBUTIONS (YEAR-WISE)

Researchers have noticed that the total numbers of 142 papers have been taken into consideration that shows from the Table 10 Figure 6. Out of 142 articles, 19.71% were the highest numbers in 2011 while 9.86% of research articles were least quantity in 2014. The range of articles published

per year throughout the time of study between 16 and 28. Researchers have observed the growth of literature output has been increased from 2008 to 2011 after that the range of growth has been decreased gradually from 2012 onwards.

Table 10: Growth of papers

Year	Volume	Total No. of Articles	Percentage
2008	13	16	11.26
2009	14	18	12.68
2010	15	24	16.91
2011	16	28	19.71
2012	17	20	14.09
2013	18	22	15.49
2014	19	14	9.86
Total		142	100.0

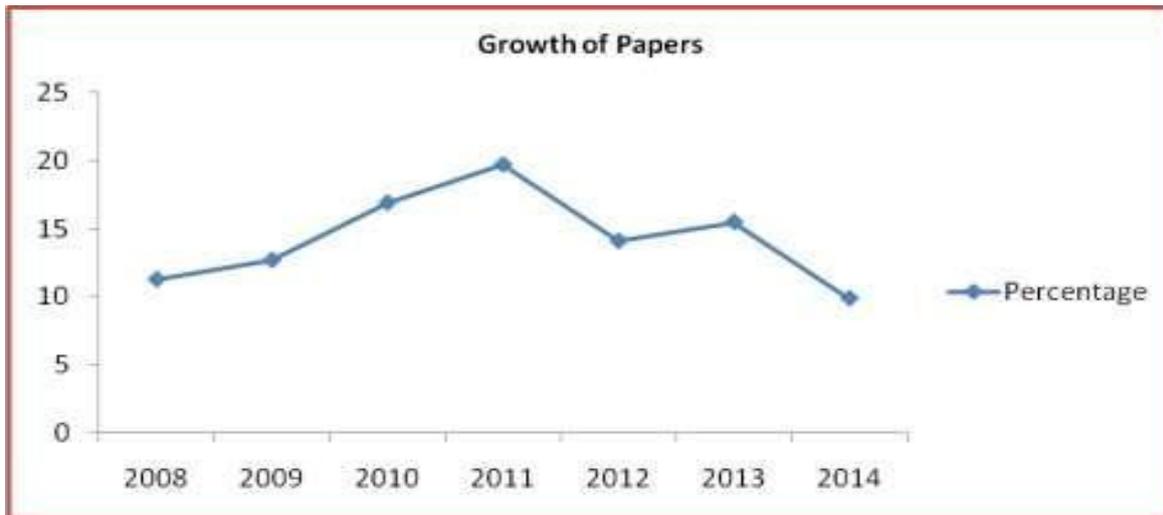


Figure 6: Year wise growth of articles

9.RESULTS

Based on the study, the results are given below.

1. Total 142 research papers articles, 19.71% were the highest numbers which were published in 2011 while 9.86% of research papers contributed in 2014.
2. Authors investigated the AGR in which the negative change of -28.57% in 2012 and an increase of 33.33% in the year 2010. The average Annual Growth Rate was 1.2617% during the period.
3. The maximum numbers (75.36 %) of contributions were by joint authors and the rest of 28 (24.64%) contributions were by single author.
4. Only 2.36 were the average quantity of authors in each article whereas 0.42 were normal productivity for each contributor. 74 (2.64) were the maximum quantity of author output in 2011.
5. The degree of collaboration in MJLIS journal was 0.75 during the period between 2008 and 2014.
6. The majority of 31.84 % contributions from Malaysia which is the first position and followed by 11.31% were contributed by Iran is the second rank and 11.01% of contributions came from India is the third position and 7.15% of contributions came from China etc.
7. In 2010, the maximum number of citations were 826 (19.25%) whereas lowest citations were 395 (9.20%) in the year 2008.

10.CONCLUSION

Publications are imperative channel and predominant communication for academics in universities as most of the articles are published or jointly published by academicians. The research publication outputs are indispensable for academics and practitioners, who are active in research. Open access journal which is very popular by publishing scholarly publications all over the world. Malaysian Journal of Library and Information Science is also one of the open access journal which is taken to analyze the study purpose. This scientometric analysis expresses the significant distinction between the solo author and multi -authors. It observes that the research collaboration and team work are the multi-faceted concept which is most vital role of scientific and technological research among the scientists and researchers in the recent day. Based on the study, it concludes that multi-authorship research is principal compare to single author contributions. The findings of the study provide valuable information for policy makers to build up scientific collaboration, particularly global collaboration and collaboration with university as well as industry associates has become more essential for the purpose of academic research.

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