Chapter – VIII

Findings, Conclusion and suggestions

8.1 Findings:

The findings are based on the analysis of collected data appended in 252 articles and 4402 references in “Program: electronic library and information systems, Quarterly” journal, 326 articles and 3973 references in “Interlending & Document Supply” journal, 629 articles and 7697 references in “Journal of Medical Library Association” journal, 278 articles and 13444 references in “Information Society” journal, 300 articles and 21616 references in “Portal Libraries and the Academy”


1. Average number of references per articles:

a) The highest number of references per article is observed in the year 2012 i.e.845 (8.33%) and lowest in the year 2003 i.e.209 (8.33%).

b) The highest number of references per article is observed in the year 2007 i.e.557 (10.4) and lowest in the year 2004 i.e.294 (10.4).

c) The highest number of references per article is observed in the year 2003 i.e.1142 (35.37%) and lowest in the year 2010 i.e.646 (12.25%).

d) The highest number of references per article is observed in the year 2005 i.e.1469 (12.2) and lowest in the year 2012 i.e.1171 (7.91).

e) The highest number of references per article is observed in the year 2011 i.e.713
(25.46%) and lowest in the year 2008 i.e. 451 (16.10%).

2. Growth Rate and doubling time of Publication:

a) The relative growth rate \([R(P)]\) and doubling time \([Dt(p)]\) of publications are derived and presented in table 3.2. It can be noticed that the relative growth rate of publications \([R(P)]\) decreased from the rate of 0.69 in 2004 to 0.08 in 2012. The mean relative growth for the first five years (i.e. 2003 to 2007) showed a growth rate of 0.35 whereas the mean relative growth rate for the last five years (i.e. 2008 to 2012) reduced to 0.22 doubling time for different years\([ Dt(p)]\) gradually increased from 0.69 in 2004 to 0.08 in 2012. The mean doubling time for the first years (i.e. 2003 to 2012) was only 1.44 which were increased to 5.29 during the last five years (2008 to 2012). Thus as the rate of growth of publications was decreased, the corresponding doubling time was increased.

b) It is observed from Table 4.2 in case of citations it was observed that the relative growth rate of citations was gradually decreased from 0.74 in 2003 to 0.09 in 2012 the mean Relative Growth \([R(C)]\) of citations during first five years (i.e. 2003 to 2007) was higher (0.33) than the last five years i.e. during 2008 to 2012 (0.11). The corresponding Doubling Time also indicate trend of 0.93 in 2003 to 7.7 in 2012. The mean Doubling Time \([Dt( C )]\) during the half period (i.e. 2003-2007) was 1.63 which was increased to 5.42 during 2008 to 2012.

c) It can be noticed that the Relative Growth of publication \([R(P)]\) increased from the rate of 4.317 in 2003 to 6.444 in 2012. The mean relative growth for the first five years (i.e. 2003 to 2007) showed a growth rate of 0.387 whereas the mean relative
growth for the last five years (i.e. 2008 to 2012) reduced to 0.115. The corresponding Doubling Time for different years (P) gradually increased from 1.179 in 2003 to 7.875 in 2012 and it also shows that there is an increase in Doubling Time to 6.268. Thus as the rate of growth of publication was increased, the corresponding Doubling Time was also increased. The Doubling Time for the first five years (i.e. 2003 to 2007) was 2.014 which was increased to 6.286 during the last five years (i.e. 2008 to 2012). Thus as the rate of growth of publication and the corresponding Doubling Time was increased.

d) The relative growth rate [R(P)] and doubling time [Dt(p)] of publications are derived and presented in Table 6.2. It can be noticed that the relative growth rate of publications [R(P)] decreased from the rate of 0.66 in 2004 to 0.08 in 2012. The mean relative growth for the first five years (i.e. 2003 to 2007) showed a growth rate of 0.31 whereas the mean relative growth rate for the last five years (i.e. 2008 to 2012) reduced to 0.11 doubling time for different years [Dt(p)] gradually increased from 0.05 in 2004 to 8.66 in 2012. The mean doubling time for the first years (i.e. 2003 to 2012) was only 1.52 which was increased to 6.32 during the last five years (2008 to 2012). Thus as the rate of growth of publications was decreased, the corresponding doubling time was increased.

e) It can be noticed that the Relative Growth of publications [R(P)] decreased from the rate of 0.511 in 2003 to 0.09 in 2012. The mean relative growth for the first five years (i.e. 2003 to 2007) showed a growth rate of 0.244 whereas the mean relative growth for the last five years (i.e. 2008 to 2012) reduced to 0.122. The corresponding Doubling Time for different years [Dt(P)] gradually increased from 1 in 2003 to 7.7
in 2012. Thus as the rate of growth of publication was decreased, the corresponding Doubling Time was increased. The Doubling Time for the first five years (i.e. 2003 to 2007) was 2.151 which was increased to 6.040 during last five years (i.e. 2008 to 2013). Thus as the rate of growth of publication was decreased; the corresponding Doubling Time was increased.

3) **Relative Growth and Doubling Time of Citations:**

   a) The Relative growth \([R(c)]\) and doubling time \([Dt(c)]\) of citations were determined and provided in the table 3.3 in case of citations it was observed that the relative growth rate of citations was gradually decreased from 0.39 in 2004 to 0.21 in 2012. The mean relative growth \([R(c)]\) of citations during first five years (i.e. 2003 to 2007) was higher (0.39) than the last five years i.e. during 2008 to 2012 (0.21).

   b) The Relative growth \([R(c)]\) and doubling time \([Dt(c)]\) of citations were determined and provided in the table 4.3 in case of citations it was observed that the relative growth rate of citations was gradually decreased from 0.69 in 2004 to 0.11 in 2012. The mean relative growth \([R(c)]\) of citations during first five years (i.e. 2004 to 2007) was higher (0.38) than the last five years i.e. during 2008 to 2012 (0.13).

   c) It is observed from Table 3 in case of citations it was observed that the relative growth rate of citations was gradually increased from 7.040 in 2003 to 9.343 in 2012. The mean Relative Growth \([R(C)]\) of Citations during first five years (i.e. 2003 to 2007) 1.82 which was increased in last five years i.e. during 2008 to 2012 to 6.514.
The corresponding Doubling Time also indicate trend of 1.042 in 2003 and 8.058 in 2012. The mean Doubling Time \([Dt(\text{C})]\) during the half period (i.e. 2003 to 2007) was 1.82 which was increased to 6.514 during 2008 to 2012. Thus the rate of growth of citations and corresponding Doubling Time has been increased.

d) The Relative growth \([R(c)]\) and doubling time \([Dt(c)]\) of citations were determined and provided in the table 6.3 in case of citations it was observed that the relative growth rate of citations was gradually decreased from 0.71 in 2004 to 0.09 in 2012. The mean relative growth \([R(c)]\) of citations during first five years (i.e. 2004 to 2007) was higher (0.33) than the last five years i.e. during 2008 to 2012 (0.12). The corresponding Doubling Time also indicate trend of 0.97 in 2004 to 7.7 in 2012. The mean Doubling Time \([Dt(\text{C})]\) during the half period (i.e. 2003 to 2012) was 0.62 which was increased to 5.70 during 2008 to 2012.

e) It is observed from Table 3 in case of citations it was observed that the relative growth rate of citations was gradually decreased from 0.459 in 2003 to 0.094 in 2012. The mean Relative Growth \([R(C)]\) of Citations during first five years (i.e. 2003 to 2007) was higher (0.24) than the last five years i.e. during 2008 to 2012 (0.12). The corresponding Doubling Time also indicate trend of 1.50 in 2003 to 7.37 in 2012. The mean Doubling Time \([Dt(\text{C})]\) during the half period (i.e. 2003 to 2007) was 2.26 which was increased to 5.81 during 2008 to 2012. Thus the rate of growth of citations has been gradually reduced and corresponding Doubling Time has been increased.
4) Form wise Distribution of references:

a) Journal, Book, thesis, Handbook, Report, Conference, Bulletin, Review, Archive. Others forms of documents cited in the journal are shown in table no. Table 3.4 gives form-wise distribution of citation analysis and shows that of the total 14278 citation 4793 citations are journals citations. It from about 43.4% of the total. This is followed by other forms such as books 0.83%, Conference proceedings 5.29%, Review 1.61%, and any others forms i.e.43.4% respectively. Which indicates that “Journal citations are more in number the Other citation” hypothesis No. 1 is not valid.

b) Journals, Boom, Thesis, Handbook, Report, Conference, Bulletin, Review, Archive, Others, forms of documents cited in the journal are shown in table no. 4.4. It forms about 54.3 % of the total. This is followed by other forms such as Books (1.53%) etc. Which indicates that “Journal Citations are more in number than other citations” hypothesis no.1 is valid.

c) The result shows that of the total 11425 citations 6677 Citations are journal citation. It forms about (58.44%) of the total. This is followed by other forms such as Books 2285 (20.00%), etc. Which indicates that “Journal Citations are more in number than other citations”. hypothesis no.1 is Valid.

d) Journals, Book, Thesis, Handbook, Report, Conference, Bulletin, Review, and Archive, Others form of documents are cited in journal are shown in table no.6.4. It forms about 31.3 % of the total. This is followed by other forms such as Books (9.51%), Conference 2.40 %, and Other forms 51.2 % respectively. Which indicates that “Journal Citations are more in number
than other citations” hypothesis no.1 is not valid.

e) The result shows that of the total 5920 citation 4206 Citations are journal citation. It forms about 71.04% of the total. Which indicates that “Journal Citations are more in number than other citations” hypothesis no.1 is Valid.

5) Authorship Pattern:

a) Authorship pattern has been studied with 252 articles. Table 3.5 indicates that the details about the authorship pattern 132 articles (52.3%) out of 252 articles have been contributed by single author 71 articles (28.1) by two authors and 32 articles (12.6%) by three authors.17 (6.74%) articles by more than three authors. Which indicates that “Single authors are more in number than co-authors” Hypothesis No 2 valid.

b) Table 4.5 indicates the details about the authorship pattern of 203 articles (62.2%) out of 326 articles have been contributed by single author 91 (27.9%) articles by two authors. 20 (6.13%) articles by three authors. 12 (3.68%) articles are more than three authors. Which indicates that “Single authors are more in number than co-authors” Hypothesis No 2 valid.

c) The authorship pattern has been studied with 629 articles. It was analyzed to determine percentage of single, two, three, four, five, six or more than six authors. It also identifies the distribution of articles according to the number of contributors. The number of single author is highest and it accounts for 293(46.58%) and the number of five author and more than five author is the lowest and it accounts for 28(4.45%). Which indicates that “Single authors are more in number” Hypothesis No.2 is valid.
d) Table 6.5 indicates that the details about the authorship pattern 140 articles (52.4%) out of 278 articles have been contributed by single author 77 articles (27.6) by two authors and 41 articles (14.7%) by three authors 20 (7.19%) articles more than three authors. Which indicates that “Single authors are more in number than multi author” Hypothesis no. 2 is valid.

e) The authorship pattern has been studied with 300 articles. It was analyzed to determine percentage of single, two, three, four, five, six or more than six authors. It also identifies the distribution of articles according to the number of contributors. The number of single author is highest and it accounts for 160(53.33%) and the five authors is the lowest and it accounts for 2(0.06%). Which indicates that “Single authors are more in number” Hypothesis No.2 is valid.

6) Year –wise Degree of collaboration:

   a) It is observed that single author articles are highest than multi author articles. The single author articles are highest in the year 2007 i.e.15 (7.53%) and highest multi author articles are observed in the year 2011 i.e.25 (7.53).

   b) It is observed that single author articles are highest than multi author articles. The single authored article are highest in the year 2005 i.e. 28 (8.58%) and highest multi author articles are observed in the year 2006 and 2012 i.e. (4.60 %).

   c) It is observed that the single author articles are higher in number than co-authors. The single authored article are highest in the year 2008 i.e.43
(11.22%) and the multi authored articles are highest in the year 2009 i.e. 40(6.36%).

d) It is observed that the single author articles are highest than multi author articles. The single author articles are highest in the year 2003 i.e. 11(6.83%) and highest multi author articles are observed in the year 2007 i.e. 20(6.83%).

e) It is observed that the single author articles are highest than multi author articles. The single author articles are highest in the year 2003 i.e. 38 (12.66%) and highest multi author articles are observed in the year 2011 i.e. 7 (0.75%).

7) Organizational Contribution :

a) It is observed that the Universities are the major contributors with 178(70.6%) authors from Universities from 2003-2012 and followed by research institute with 74 (29.3%). Which indicates that “Universities are major contributors”. Hypothesis No. 3 valid.

b) It is observed that the Universities are the major contributors with 223 (68.4) Contribution from 2003-2012 and followed by research institute with 103 (31.5%) contribution. Which indicates that “Universities are major contributors”. Hypothesis No. 3 is valid.

c) In organization wise contribution it is observed that Universities are the major contributors with 508 (80.76%) contribution from 2003-2012 and followed by other institute with 72(11.44%) contribution. Where Hypothesis No.3 is valid i.e.”Universities are major contributors”. 

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d) It is observed that the Universities are the major contributors with 237 (85.2%) contribution from 2003-2012 and followed by other institute with 41 (14.7%) contribution. Which indicates that “Universities are major contributors”. Hypothesis no. 3 is valid.

e) In organization wise contribution it is observed that University are major contributors with 195 (90.69%) contribution from 2003-2012. Which indicates that “Universities are the major contributors”. hypothesis No.3 is valid.

8) Country wise distribution:

a) The countries on the basis of no. of citations published are shown in table. The country having a maximum number of 252 articles have been considered. Table reveals that UK, USA, India have; 87(34.5); 16(6.34); 32(12.6).

b) The countries on the basis of no. of citations published are shown in table. The country having a maximum number of 3973 citations appended in 326 articles have been considered. Table reveals that UK, USA, and France have; 123(37.7); 62(19.0); 17(5.21).

c) The countries on the basis of no of articles are shown in table. The countries having a maximum number of 629 articles have been considered. The study regarding the country wise distributions of articles has been done in order to know the most dominant countries in which the information is cited. It was seen that The Netherlands have 57(27.94%).

d) The countries on the basis of no. of citations published are shown in table. The country having a maximum number of 278 articles have been considered.
Table reveals that USA, UK, Netherlands, Canada have; 128(46.0); 29(10.4); 20(7.19); 17(6.11).

e) The countries on the basis of no of articles are shown in table. The countries having a maximum number of 300 articles have been considered. The study regarding the country wise distributions of articles has been done in order to know the most dominant countries in which the information is cited. It was seen that USA has 90 (30.00%).

9) Ranked List of most cited journals:

a) It was observed that the Program: electronic library and information systems ranked 1st in position than other journal with maximum of citations i.e.197 (10.8%).84 journals with 2 citations & 383 journals with 1 citation respectively.

b) It was observed that the Interlending & Document Supply ranked 1st in position than other journal with maximum of citations i.e. 245(25.2%).245 journals with 2 citations & 34 journals with 1 citation respectively.

c) The journals Citations were further analyzed to establish a list of journals. Table 9 provide ranked list of the most frequently cited journals in both journals under study. It was observed that the Bulletin of Medical Library Association journal ranked 1st in position than other journal with maximum number of citations i.e. 856(12.87%).482 journals were 2 citations and 523 journals with 1 citations respectively.
d) It was observed that the Information Society ranked 1st in position than other journal with maximum of citations i.e.404 (9.59%).202 journals with 2 citations & 814 journals with 1 citation respectively.

e) The journals Citations were further analyzed to establish a list of journals. Table 9 provide ranked list of the most frequently cited journals in journal under study. It was observed that the College & Research Libraries ranked 1st in position than other journal with maximum of citations i.e.301 (7.15%).297 journals with 2 citations & 376 journals with 1 citation respectively.

10) Chronological distribution of citations:

a) The study regarding the ranking of year wise citations has been done in order to know the most dominant year. Ranking of the year of distribution of citation which shows that 2995 the highest number of citations out of a total of 4402 citations is in the year 2001-2010 and lowest number of citation in year 1911-1920.

b) The study regarding the ranking of year wise citations has been done in order to know the most dominant year. Ranking of the year of distribution of citation which shows that 2786 the highest number of citations out of a total of 3973 citations is in the year 2001-2010 and 1931-1941 lowest number of citation in year 1901-1910 and 1931-1940.

c) The study regarding the ranking of year wise citations has been done in order to know the most dominant year; the ten year span of period was undertaken for the study. Table 10 gives Ranking of the year of distribution of citation which shows that 6239 the highest number of citations out of a total of 11425
citations is in the year 2001-2010 and lowest number of citation in year 1900 & before.

d) The study regarding the ranking of year wise citations has been done in order to know the most dominant year. Ranking of the year of distribution of citation which shows that 6570 the highest number of citation out of a total of 13444 citations is in the year 2001-2010 and lowest number of citation in year 1901-1910. Where it is seen that the researchers cite the latest document. The study also shows that last 18-22 years 1991-2012 literature was cited highest.

e) The study regarding the ranking of year wise citations has been done in order to know the most dominant year; the ten year span of period was undertaken for the study. Table 10 gives Ranking of the year of distribution of citation which shows that 3196 the highest number of citations out of a total of 5920 citations is in the year 2001-2010 and lowest number of citation in year 1911-1920.

11) Year-wise percentage of articles having Web references and Print references

a) It can be seen that total 4402 references are appended to 252 articles out of which 2659 (60.40) are print references 1743 (39.59) web references of which maximum web references are in the year 2005, 164 (44.56) appended to 27 articles. Whereas maximum print references are in the year 2012, 684 (80.94) appended to 21 articles.

b) It can be seen that total 3973 references are appended to 326 articles out of which 430(77.19%) are print references 924 (23.25%) web references of which maximum. Web references are in the 166 (40.48%) appended to 30
articles. Whereas maximum print references are in the year 2007, 430 (77.19%) appended to 34 articles.

c) It can be seen that total 11425 references are appended to 629 articles, out of which the print references are highest in number i.e. 9642 and 1783 are web references of which maximum web references are seen in the year 2007 i.e. 422 appended to 52 articles. Whereas maximum print references are in year 2008 i.e. 1473 from 38 articles.

d) It can be seen that total 13444 references are appended to 278 articles out of which 11854 (88.1%) are print references 1590 (11.8%) web references of which maximum. Web references are in the 288 (20.1%) appended to 29 articles. Whereas maximum print references are in the year 2005, 1356 (92.3%) appended to 34 articles.

e) It can be seen that total 5920 references are appended to 300 articles, out of which the print references are highest in number i.e. 5920 (100%) and there are no web references.

12) Length of articles:

a) Out of 252 articles 168 (66.6%) had 11-20 pages followed by 60 (23.8%) had 01-10 pages. The lowest range being 1 (0.39%) articles in the range of 31-40 and 41-50.

b) Out of 326 articles 208 (63.8%) had 11-20 pages followed by 76 (23.3%) had 01-10 pages. The lowest range being articles in the range of 31-40 only 3 (0.92%).
c) The result aptly reflects the distribution of length of the articles during the period of study. Out of 629 articles 275 (43.72%) had 1-5 pages followed by 273 (443.40%) had 6-10 pages. The lowest range being 1 (0.16%) articles in the range of 31-35.

d) Out of 278 articles 182 (65.4%) had 11-15 pages followed by 81 (29.1%) had 1-10 pages. The lowest range being 15 (5.39%) articles in the range of 21-30.

e) The result aptly reflects the distribution of length of the articles during the period of study. Out of 300 articles 93 (31%) had 11-15 pages followed by 81 (27%) had 16-20 pages. The lowest range being 1 (0.33) articles in the range of 36-40. Only 1 (0.33) article had length of 36-40 pages.
8.2 Conclusion:

Scientometrics is a branch of bibliometric where the unit of analysis is a document that is being cited as a bibliographic reference. It is the study of the distribution or scattering of references. The present study has been conducted Scientometric analysis of the “Program: electronic library & information system, Interlending & Document Supply, Journal of the Medical Library Association, Information Society, Portal: Libraries and the Academy “on the basis of Parameters laid down in the objectives of the study.

8.3 Suggestion:

The authors of an article while citing the works of other authors should cite bibliographical details, title of work, and year of publication. Citation analysis of journal will help the librarians to guide, subscribe useful journal. The analysis will help the librarian to handle library and information center.

8.4 Areas for Further Study:

Based on the experience gained through the present research it has been suggested that the following are the areas which may be considered for undertaking the further research:

1. The citation analysis of various journals can also be undertaken for the studies.
2. Scientometric Study of Post Graduate Project on Social Sciences & Science.