

**A BIBLIOMETRIC ANALYSIS OF DAFFODIL
INTERNATIONAL UNIVERSITY JOURNAL OF SCIENCE
AND TECHNOLOGY: A STUDY OF ARTICLES PUBLISHED
FROM 2006 TO 2012**

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***Abstract:** The study presents a Bibliometric analysis on “Daffodil International University Journal of Science and Technology (DIUJST)”. The study has been conducted on 142 articles published in the DIU Journal of Science and Technology during the period 2006-2012. A good number of articles were found to cover the field of Computer Science and Engineering. Most of the articles are written by Bangladeshi author(s). The authors who have published the maximum number of articles and research papers distributions on different criterion have been identified. The important foreign and Bangladeshi articles having maximum number of citations have also been observed.*

***Keywords:** Bibliometric, citation analysis, science & technology.*

Introduction

Periodicals are the primary sources of information and an important medium for communication. They play a major role in communicating the latest research findings and publishing the articles. It fosters the current development in any field of knowledge (S. Thanuskodi, 2010). Bibliometrics is an emerging thrust area of research in the field of Library and Information Science (LIS) and has practical applications in measuring the coverage and quality of journals (Parameswaran, M. and K.G. Smitha, 2001).

Bibliometrics is a set of methods to quantitatively analyze scientific and technological literature. It is now used in quantitative research assessment exercises of academic output (Nazim, Mohammad and Ahmad Moin., 2007). Bibliometric as a term was introduced by Pritchard in 1969. At the same time Nalimov and Mulchenko introduced the term scientometrics. Pritchard defined Bibliometric as “the application of mathematical and statistical methods to book and other media of communication”, while Nalimov and

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Mulchenko in 1969 defined scientometrics as “*the application of those quantitative methods which are dealing with the analysis of science viewed as an information process*”. Today the two terms are used almost as synonymous. Nowadays Bibliometrics is closely related to research within the areas of library science, information retrieval and sociology of science. It has also been used as a research management tool and a tool for research into research management. Bibliometrics literally means “book measurement”. What is measured is not the physical properties but statistical patterns in variables such as authorship, sources, subjects, geographical origins and citations not just with respect to books but largely related to journals (Dixit, Swati and Katare, V.V. , 2007).

Bibliometrics has established itself as a viable and distinctive research technique for studying impact factor on citation data. Bibliometric studies are used to identify the pattern of publications, authorship citations and secondary journal coverage which can give an insight into the research and development of the area under consideration (Biswas, B.C. Roy and A & Sen, B.K., 2007). It is also found quite useful for establishing and analyzing research output & academic relationships between contributors, journals, subjects and even among countries. Bibliometric indicators are quite helpful in mapping scholarly publications and could be good tools, which help in better understanding, in tracing then linkage between individual scholars, institutions and organizations (Haque, Md. Enamul, 2007).

The current study is a Bibliometric analysis of Daffodil International University Journal of Science and Technology (DIUJST). The journal is focused in various fields of Science and Technology and published by the Daffodil International University, Dhaka. It was first published in July 2006 with original work of author(s) in the form of critical reviews, research explanation and research papers. This journal is published twice a year and 07 volumes of the journals have been published till July of 2012. A substantial number of such studies have been carried out during that period.

Objectives of the study

The specific objectives of the present study are as follows:

1. To analyze the year-wise distribution of articles.
2. To find out the length of articles.
3. To identify the authorship pattern of the articles.
4. To determine the distribution of articles by country.
5. To observe the organization-wise distributions of the author(s).

6. To know the proportions of contributions at home and abroad.
7. To show the citation patterns.
8. To clarify the subject specific distributions of articles.

Methodology

The data comprised seven (07) volumes of thirteen (13) issues (since July 2006, the journal was published twice a year) of the DIU journal of Science and Technology published during 2006-2012. The valuable data from each published article was gathered and analyzed very cautiously to record the details of the title, author(s), number of authors, number of references for each article, type of references, contributing organizations and main subjects of the articles. The collected data was noted manually, arranged systematically and tabulated by year for extensive analysis.

Analysis and discussion of Data

Year-wise distribution of articles

It is revealed from table-1 that the total number of articles published during the year of 2006-2012 is 142. Highest number of articles per year published is 23 (16.19%) during 2010-2012 and minimum number of articles per year published is 10(7.04%) in 2006. The number of articles per volume is semi uniform. Only single issue was published 10 (7.04%) in July 2006.

Table 1: Year-wise distribution of articles

| Year of Publications | Number of articles | Percentage (%) |
|-----------------------------|---------------------------|-----------------------|
| 2006 | 10 | 7.04 |
| 2007 | 20 | 14.08 |
| 2008 | 21 | 14.79 |
| 2009 | 22 | 15.49 |
| 2010 | 23 | 16.20 |
| 2011 | 23 | 16.20 |
| 2012 | 23 | 16.20 |
| Total | 142 | 100 |

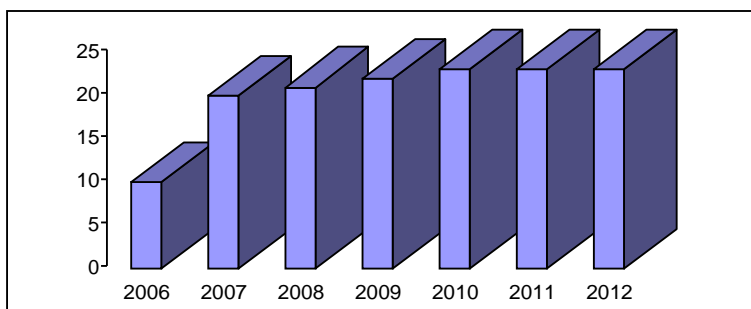


Table-2 indicates the length of the articles, which were published during 2006-2012. Out of 142 papers, 56 (39.43%) contains the ranging from 1-5 pages, 76 (53.52%) contains 6-10 pages and 10 (7.04%) contain more than 10 pages which was published in 2010-2011.

Table-2: Length-wise analysis of articles by year

| Year of Publications | 1-5 pages | 6-10 pages | >10pages |
|----------------------|-----------|------------|----------|
| 2006 | 05 | 04 | 01 |
| 2007 | 05 | 14 | 01 |
| 2008 | 11 | 10 | - |
| 2009 | 13 | 08 | 01 |
| 2010 | 07 | 13 | 03 |
| 2011 | 08 | 12 | 03 |
| 2012 | 07 | 15 | 01 |
| Total | 56 | 76 | 10 |
| Percentage (%) | 39.43% | 53.52% | 7.04% |

Table-3 reveals the total scenario of the authorship pattern in the journal of Science and Technology during 2006-2012. After analyzing the total articles it is found that most of the articles were published 74 (20.44%) by more than three authors. This is healthy trend for any field of research. This attitude should always continue to obtain better research findings. The highest contributions 41 (11.32%) were published by double authors and 27 (7.46%) were published by single author. It is seen that most of the articles were published jointly.

Table-3: Authorship Pattern

| Year of Publications | Number of Author(s) | | |
|----------------------|---------------------|------------------|-------------------------|
| | Single author | Double author(s) | Three or more author(s) |
| 2006 | 02 | 04 | 04 |
| 2007 | 03 | 05 | 12 |
| 2008 | 03 | 07 | 11 |
| 2009 | 06 | 05 | 11 |
| 2010 | 05 | 07 | 11 |
| 2011 | 03 | 07 | 13 |
| 2012 | 05 | 06 | 12 |
| Total | 27 | 41 | 74 |
| (% percentage) | 7.46% | 11.32% | 20.44% |

Table-4 shows the detail of references was used in the DIU Journal of Science and Technology during the period 2006-2012. Reference plays a vital role in research findings related to documents in a particular field. It helps in furthering the research work for finding new one. The maximum author(s) used citation 11-20 references in their articles 65(45.77%), nearest 1-10 references 60 (42.25%) and 21-30 references 15(10.56%). It reveals that there were only 02 articles (1.41%) which contain more than 30 references in 2011.

Table-4: Citation of References

| Year of Publications | Number of references | | | |
|----------------------|----------------------|-------|-------|------|
| | 1-10 | 11-20 | 21-30 | >30 |
| 2006 | 05 | 04 | 01 | - |
| 2007 | 11 | 07 | 02 | - |
| 2008 | 08 | 11 | 02 | - |
| 2009 | 13 | 09 | - | - |
| 2010 | 07 | 12 | 04 | - |
| 2011 | 07 | 12 | 02 | 02 |
| 2012 | 09 | 10 | 04 | - |
| Total | 60 | 65 | 15 | 02 |
| Percentage (%) | 42.25 | 45.77 | 10.56 | 1.41 |

From Table-5 reveals that total of 362 authors, 142 articles and 1911 references appeared in the DIU Journal of Science and Technology. The highest number of authors (61) contributed (23) articles and used (349) references whereas 15.17 references were used per article in 2011. It is also found that the authors (57) were used 307 and 328 references during 2008-2010 while 14.62 and 14.26 references per article respectively. Authors (25) contributed 10 articles in 2006 and used (134) references because of the single issue published.

Table-5: Comparison among author(s), articles and references

| Year of publications | Total author(s) | Total articles | Total references | References/articles |
|----------------------|-----------------|----------------|------------------|---------------------|
| 2006 | 25 | 10 | 134 | 13.4 |
| 2007 | 52 | 20 | 235 | 11.75 |
| 2008 | 57 | 21 | 307 | 14.62 |
| 2009 | 54 | 22 | 234 | 10.64 |
| 2010 | 57 | 23 | 328 | 14.26 |
| 2011 | 61 | 23 | 349 | 15.17 |
| 2012 | 56 | 23 | 324 | 14.09 |
| Total | 362 | 142 | 1911 | 13.45 |

Relationship between Author(s), Articles and References

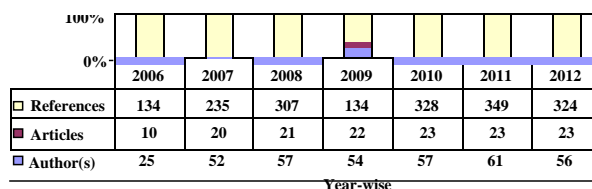


Table-6 presents an alphabetical list of countries that shows the distribution of author(s) by country in producing their articles in the DIU Journal of Science and Technology during 2006-2012. Maximum articles 105 (73.94%) out of 142 originated from Bangladesh. International author's articles 11 (7.75%) & 9 (6.39%) were contributed from India and Japan respectively. Author(s) from Malaysia and South Korea also contributed their articles 4(2.81%) & 3(2.11%).

Table-6: Country-wise contribution of articles

| Name of the countries | Number of articles | (%) percentage |
|-----------------------|--------------------|-----------------|
| Australia | 01 | 0.70 |
| Bangladesh | 105 | 73.94 |
| Belgium | 01 | 0.70 |
| Germany | 01 | 0.70 |
| India | 11 | 7.75 |
| Italy | 02 | 1.41 |
| Japan | 09 | 6.39 |
| Malaysia | 04 | 2.81 |
| Nigeria | 02 | 1.41 |
| Pakistan | 01 | 0.70 |
| Singapore | 01 | 0.70 |
| South Korea | 03 | 2.11 |
| USA | 01 | 0.70 |
| Total | 142 | 100% |

Table-7 clearly indicates that out of 1911 references 801 journals references were used in articles (142) whereas books (380), IEEE (186), conference papers (272), web links (104), seminar papers (45), symposium (41), theses (24). In 2012, books (67) were used in (23) articles whereas (137) journals used out of 801. In 2006, IEEE communication magazines (186) were used as main source references of maximum articles which was published in this year on communications and information technology. Particular resources are required in furthering the research work. It is seen that the use of web links also increased gradually in each article.

Table-7: Citation of resources (year-wise)

| Years | No . of articles | No. of reference | References | | | | | | | | | |
|-------|------------------|------------------|------------|-----------|-------|--------|----------|---------|-----------|-------------|----------|-----------------|
| | | | Bo oks | Jour nals | Co nf | Se mi. | Wo rks . | Th esis | Web links | Sympos ium. | Repo rts | IEEE magazi nes |
| 2006 | 10 | 134 | 25 | 48 | 17 | 05 | 02 | - | 19 | 04 | 03 | 10 |
| 2007 | 20 | 235 | 56 | 70 | 22 | 03 | 03 | - | 12 | 03 | - | 66 |
| 2008 | 21 | 307 | 51 | 94 | 65 | 02 | - | - | 11 | 01 | 02 | 58 |
| 2009 | 22 | 234 | 55 | 123 | 34 | 01 | 05 | - | 03 | 01 | - | 10 |
| 2010 | 23 | 328 | 65 | 146 | 43 | 09 | - | 13 | 26 | 12 | 01 | 11 |
| 2011 | 23 | 349 | 61 | 183 | 48 | 13 | - | 06 | 05 | 07 | - | 16 |
| 2012 | 23 | 324 | 67 | 137 | 43 | 12 | - | 05 | 28 | 13 | - | 15 |
| Total | 142 | 1911 | 380 | 801 | 272 | 45 | 10 | 24 | 104 | 41 | 06 | 186 |

Table-8 shows that maximum authors were Lecturers (202) and highest number of Lecturers contributed in 2011 (36). It is also seen that Scientific Officers (53) contributed to their research papers in Textile Engineering. It is observed from the table that 39 Professors contributed their research papers in the field of Science and Technology. 15 authors were doing their PhD as research assistant and they have been co-authored with their supervisors.

Associate Professors (06) out of (362) authors contributed in the DIU Journal of Science and Technology during 2006-2012. Senior Lecturers (08) have fewer contributions in DIUJST.

Table-8: Analysis of author(s) category pattern

| Year s | No. of articles | Category of author(s) | | | | | | | | | | |
|--------|-----------------|-----------------------|------------|--------------------|---------------|---------|--------------------|----------|--------------|-------------|-----------------|-------|
| | | Student | Researcher | Scientific officer | Asst. manager | Manager | Software developer | Lecturer | Sr. Lecturer | Asst. Prof. | Associate Prof. | Prof. |
| 2006 | 10 | - | 02 | - | 01 | 01 | - | 10 | 01 | 02 | 01 | 05 |
| 2007 | 20 | 02 | 01 | - | - | - | - | 32 | - | - | - | 16 |
| 2008 | 21 | - | 04 | 09 | - | - | - | 35 | 01 | 02 | - | 07 |
| 2009 | 22 | - | 02 | 20 | - | - | 01 | 29 | 01 | 03 | 01 | - |
| 2010 | 23 | 01 | 01 | 13 | - | - | 02 | 29 | 02 | 05 | 02 | 03 |
| 2011 | 23 | 01 | - | 11 | 01 | 01 | - | 36 | - | 02 | 01 | - |
| 2012 | 23 | 03 | 05 | - | - | - | - | 31 | 03 | 06 | 01 | 08 |
| Total | 142 | 06 | 15 | 53 | 02 | 02 | 03 | 202 | 08 | 20 | 06 | 39 |

Table-9 indicates that maximum articles 105 (73.94%) were contributed from Bangladesh in the DIU Journal of Science and Technology. Rest of articles 37(26.06%) were contributed from foreign author(s), i.e. twelve (12) author(s) of foreign countries sent their research papers in the Journal of DIUJST. It is revealed that almost one third of research papers published in this journal which originated from foreign author(s).

Table-9: Proportion of contribution in home and abroad

| Region | Number of contribution articles | Percentage (%) |
|------------------------|---------------------------------|----------------|
| Bangladesh | 105 | 73.94% |
| Foreign (12 countries) | 37 | 26.06% |
| | 142 | 100% |

Table-10 reveals the distribution of different institutions with which authors are affiliated. Most author(s) are from Educational Institute (125) out of (142) articles originated from academic institutions and (16) articles from professional / research institutions and the rest were from other organizations.

Table-10: Organization-wise distribution of articles

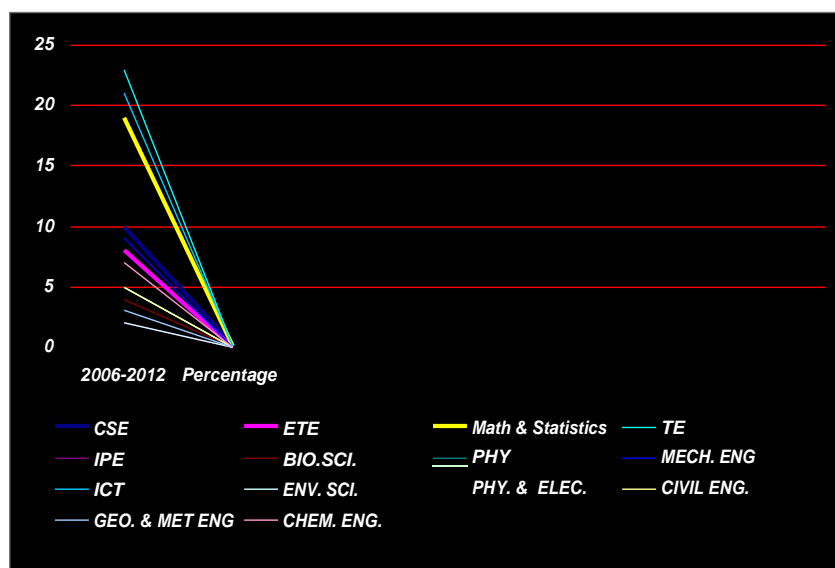
| Year | Educational Institute | Research Institutes | Others | Total |
|-------|-----------------------|---------------------|--------|-------|
| 2006 | 10 | - | - | 10 |
| 2007 | 20 | - | - | 20 |
| 2008 | 17 | 04 | | 21 |
| 2009 | 16 | 06 | - | 22 |
| 2010 | 19 | 03 | 01 | 23 |
| 2011 | 20 | 03 | - | 23 |
| 2012 | 23 | - | - | 23 |
| Total | 125 | 16 | 01 | 142 |

Table-11 shows the distribution of articles by core discipline published in the DIU Journal of Science and Technology. Maximum 30 (21.12%) articles were published in the field of Computer Science and Engineering. The publication of 23 articles (16.19%) of Textile Engineering was second contributor in the journal. Communication and Information Technology 21(14.78%), Mathematics and statistics 19(13.38%), Mechanical Engineering 9(6.33%), Electric and Electronic Engineering 8(05.63%), Chemistry and Chemical Engineering 7(4.93%) Physics, Applied Physics and Electronic, Civil Engineering 5 (3.52%) published in the journal. The rest from Industrial and production engineering 2(1.40%), Environmental Science 2(1.40%) were also published.

Table-11: Subject-wise distribution of articles

| Subjects | Number of articles | | | | | | | Total | Percentage |
|---------------------------------|--------------------|------|------|------|------|------|------|-------|------------|
| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | | |
| Computer Sc. and Engr. | 02 | 07 | 04 | 03 | 06 | 04 | 04 | 30 | 21.12% |
| Electric and Electronic Engr. | 02 | 01 | 01 | - | 01 | 03 | - | 08 | 05.63% |
| Math and Statistics | | 02 | 01 | 04 | 06 | 05 | 01 | 19 | 13.38% |
| Textile Engr. | | 01 | 04 | 08 | 03 | 05 | 02 | 23 | 16.19% |
| Industrial and production Engr. | | 01 | - | - | - | - | 01 | 02 | 1.40% |
| Biological Sc. | | - | - | 01 | - | 01 | 02 | 04 | 2.80% |
| Physics | 01 | - | - | 01 | - | - | 03 | 05 | 3.52% |
| Mechanical | 01 | - | 02 | - | 01 | 02 | 03 | 09 | 6.33% |

| | | | | | | | | | |
|---------------------------------|----|----|----|----|----|----|----|-----|--------|
| Engr. | | | | | | | | | |
| Communication and Info. Tech. | 02 | 03 | 08 | 01 | 01 | 01 | 05 | 21 | 14.78% |
| Environmental Science | 01 | - | - | 01 | - | - | - | 02 | 1.41% |
| Applied Physics and Electronics | - | 02 | 01 | 01 | - | - | - | 05 | 3.52% |
| Civil Engineering | 01 | 02 | - | - | - | - | 02 | 05 | 3.52% |
| Geology and Metallurgical Engr. | - | 01 | - | - | 01 | 01 | - | 03 | 2.11% |
| Chemistry and Chemical Engr. | - | - | - | 02 | 04 | 01 | - | 07 | 4.93% |
| Total | 10 | 20 | 21 | 22 | 23 | 23 | 23 | 142 | 100% |



The following are the major findings of the present study:

1. The number of articles published per volume is semi uniform.
2. Only single issue was published in 2006 (July).
3. The highest number of articles contributed from Academic Institutions.

4. Maximum number of publications originated from the author(s) of Bangladesh 105 (73.94%).
5. The maximum publication is on Computer Science & Engineering 30(21.12%) and the predecessor of Textile Engineering 23(16.19%) in the journal.
6. Author(s) from twelve foreign countries sent their research papers in the journal.
6. Good number of scientific officers were contributed their research papers in the journal.
8. Almost all articles contain keywords except four articles.
9. Senior Lecturers have fewer contributions in this journal during 2006-2012.
10. The use of web links was gradually increased than seminar papers in research paper published in DIU journal of science and technology.

Conclusion

It can be concluded from the findings of this study that DIU journal of Science Technology is playing a vital role in the research field of science and technology. This study has also highlighted the variety of Bibliometric measures. It can be used to understand the characteristics of the journal which reflects the characteristics of the literature and the communication behavior. It will be more standard when foreign publications and industrial research papers will be included in DIU journal of science and technology. It is also observed from the study that DIU journal will be more dignified when assistant /associate professors will have to contribute more their research papers in the journal precious.

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