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CONTENTS

Impact of ICT Based Resources and Services on the Medical Students of Selected Academic Institutions in Puducherry

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Abstract

This paper explores the impact of ICT based resources and services available in three medical libraries in the undergraduate students. A total 50 questionnaires each were distributed to the medical students of the three colleges by convenient sampling to represent the overall population. The total number of responses received back from the users was 120 with a response rate of 80%. The findings revealed that Research purposes were found to be the most used option for respondents on the purpose of using ICT tools and services which amounts to 71.67 percent. Also use of e-resources witnessed that e-books were found to be the most used amongst various e-resources which accounts for 70 percent. The other used resources include e-journals (56.67%), e-magazines and e-newspapers (42.5% each), etc.

***Keywords**: E-resources, ICT based resources, ICT based services, Impact study, Medical libraries, Medical students.*

1. INTRODUCTION

Application of ICT in library and information work has revolutionized the traditional concept of libraries from a 'storehouse of books to an intellectual information centre' connoting the concept of electronic or digital library. It has opened up a new chapter in library communication and facilitated global access to information crossing the geographical limitations. Using ICT, libraries are also playing a very important role in facilitating access to global information and knowledge resources. Information and Communication Technology (ICT) is a comprehensive concept and parallel concept with Information Technology (IT) that denotes not only a single unit of technology but an assemble of technologies like telecommunication equipment, data processing equipment, semi conductors, consumer electronics, etc. The emergence of ICT is one of the wonderful gifts of modern science and technology which has brought a sea change in the way the libraries and information centres render services to their users in the changing environment. Application of ICT in library and information work has revolutionized the traditional concept of libraries from a 'storehouse of books to an intellectual information centre' connoting the concept of electronic or digital library. It has opened up a new chapter in library communication and facilitated global access to information crossing the geographical limitations. Using ICT, libraries are also playing a very important role in facilitating access to global information and knowledge resources. In view of the above, it was intended to study the impact of ICT based resources and services on the students in selected medical college libraries in Puducherry region.

2. LITERATURE REVIEW

There are many studies on the use of internet as a tool to find information which in turn enables the medical professionals to take decisions on their professional related issues. Koller [1] found that 14 percent of the primary care physicians used internet regularly and 59 percent of the practitioners used textbooks and their colleagues to solve patient-specific problems during daily practice. Casebeer et al [2] argued that almost all the physicians accessed Internet for journals and local CME meetings which remain important to physicians for their learning and patient care [3]. Dawes and Sampson found that the most frequently used resources by the physicians include hard copy text sources and colleagues. This finding contrasted with Groote and Dorsch [4] that the respondents preferred online resources to print as the online resources were accessible remotely. It is evident that 80.9 percent of the physicians used Internet as a medium to have access to medical related databases.

3. OBJECTIVES OF THE STUDY

The study based on three medical colleges was carried to:

i. assess the state-of-the-art infrastructure of information and communication technology (ICT) facilities existing in medical college libraries of Puducherry;
ii. identify ICT based resources available for UG students in medical college libraries of Puducherry;
iii. identify the ICT based services rendered in medical college libraries of Puducherry;
iv. analyse the purpose of using ICT based resources and services;
v. study user's perceptions on the use of ICT based resources and services in teaching-learning and research; and
vi. assess the level of satisfaction of the respondents with ICT based resources and services including medical related software packages.

4. POPULATION AND SAMPLING

The target population constitutes medical professionals from three medical colleges in Puducherry namely

i. Aarupadai Veedu Medical College (AVMC),
ii. Mahatma Gandhi Medical College & Research Institute (MGMC&R), and
iii. Pondicherry Institute of Medical Sciences and Research (PIMS).

A total 150 questionnaires each were distributed to the medical students of the above mentioned three colleges by convenient sampling method to represent the overall population. The total number of responses received back from the users was 120 with a response rate of 80%. The questionnaires were self-administered and personally hand-delivered. Apart from the personal interaction, e-mails and phone calls were used to follow up the participants. The scope of the study is confined to the users of only three Medical Colleges in Pondicherry. The category of the respondents was restricted to only MBBS students.

5. DATA ANALYSIS AND INTERPRETATION

5.1 Gender-wise Distribution of Respondents

Table 1 shows the gender wise distribution of respondents of three medical under study. Among the total number of 40 respondents of AVMC, 90% are male and 10% are female. Out of 40 respondents of MGMC&R, 18% was male and 82% was female while out of 40 respondents of PIMS, 62.5% was male and 37.5% was female. On the whole, it was observed that out of 120 respondents, 68 respondents were male and the remaining 52 respondents were female. There is no wide gap between the male (56.67%) and female (43.33%) respondents.

Table 1 Distribution of Respondents by Gender

Gender	AVMC	MGMC&R	PIMS	Total	%
Male	36(90%)	7(17.5%)	25(62.5%)	68	56.67
Female	4(10%)	33(82%)	15(37.5%)	52	43.33
Total	40(100%)	40(100%)	40(100%)	120	100.00

5.2 Use of E-resources

Table 2 presents the results of opinion of respondents on the use of E-resources. It was found that 35 respondents, in the case of AVMC used E-Text books followed by E-Journals (29), E-Newspaper (28), E-Magazines and E-Reference books (27 each), CD/DVD (18), E-Theses (16). However a total number of 26 respondents opined against the use of E-resources.17 respondents, in the case of MGMC&R used E-Text books followed by E-Reference books (11), CD/DVD (5), E-Journals and E-Magazines (4), E-Newspaper (28). It was also observed that 35 respondents, in the case of PIMS used E-Journals (35) followed by E-Text books (32), E-Reference books (30), E-Theses (22), E-Newspaper and E-Magazines (20), CD/DVD (15). However a total number of 25 respondents were not in favour of using E-resources. On the whole, it was observed that E- text books, were found to be the most used E-resources which accounts for 70 percent. The other used resources include E-reference books and E-journals (56.67% each), E-magazines and E-newspaper (42.5% each), E-theses and CD/DVD (31.67% each). It is quite interesting that the respondents of AVMC and PIMS have used E-resources more than that of MGMC&R.

Table 2 Opinion on the Use of E-resources

Parameter	AVMC		MGMC&R		PIMS		Total		Percentage	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
E-Text Books	35	4	17	21	32	2	84	27	70	22.5
E-Reference Books	27	4	11	28	30	2	68	34	56.67	28.33
E-Journals	29	3	4	29	35	2	68	34	56.67	28.33
E-Theses	16	3	---	33	22	4	38	40	31.67	33.33
E-Magazines	27	4	4	29	20	4	51	37	42.5	30.83
E-Newspapers	28	3	3	31	20	4	51	38	42.5	31.67
CD/DVD	18	5	5	29	15	7	38	41	31.67	34.17

5.3 Print Vs. Electronic Sources

Table 3 explains the importance of print sources as compared to electronic sources. Out of 120 respondents, 72(60%) responded 'Very important'; 35(29.17) responded 'Moderately important'; 24(20%) responded 'somewhat important'; 14(11.67) responded 'Not important'; and 15(12.5%) responded that they don't know. It was found that majority of the students responded 'very important' and quite a considerable amount of respondents opined 'somewhat important'. However, the result indicates that print resources are very important as that of the e-resources.

Table 3 Opinion on Print Vs Electronic Sources

Parameter	AVMC		MGMC&R		PIMS		Total		Percentage	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Very Important	38	0	9	8	25	3	72	11	60	9.17
Moderately Important	9	3	18	5	8	1	35	9	29.17	7.50
Somewhat Important	8	3	12	20	4	2	24	25	20	20.83
Not Important	7	3	5	10	2	2	14	15	11.67	12.50
Don't know	8	3	3	11	4	1	15	15	12.5	12.50

5.4 Use of ICT Tools

Table 4 presents the results of opinion of respondents on the use of ICT tools. The result indicates that 38 respondents, in the case of AVMC used Internet followed by wireless internet (37), Phone (34), Video conference and Mobil Phone (30), Barcode Scanner (27), Audio & Video player (24) and so on. 31 respondents, in the case of MGMC&R used WiFi followed by internet (30), Mobil Phone (13), Barcode Scanner (12), phone (3) and so on. On the other hand, 35 respondents, in the case of PIMS used internet followed by WiFi (30) , Phone(25), Audio & Video player and Laser printer (22), Mobil Phone (20) and so on. On the whole it was observed that Internet was found to be the prevalently used ICT tool which accounts for 85.83 percent. The other used tools include WiFi (81.67%), Mobile phone (52.50%), Phone (51.67%), Audio & Video player (40%), Barcode scanner (36.67%) and so on. It is quite interesting that the respondents of AVMC and PIMS have used ICT tools more than that of MGMC&R.

5.5 ICT based Services

Table 5 presents the results of the opinion on the awareness and use of ICT based services. The result shows that 36 respondents, in the case of AVMC used E-books followed by E-journals (33), Library Website (28), and Multimedia service (27) and so on. 25 respondents, in the case of MGMC&R used web OPAC followed by online database and Library Website (22), Circulation of new additions list (19) and so on. 35 respondents, in the case of PIMS used Internet services followed by E-books (33), E-journals (30), and Library website (28) and so on. The overall opinion reveals that 78(65%) respondents were using E-books and Library website, followed by Internet services (60%), Online database and E-Journals (54.17%), Multimedia service (42.5%) Web OPAC (27.50%) and so on. It is quite interesting that the respondents of AVMC and PIMS have used ICT based services more than that of MGMC&R.

Table 4 Distribution of Opinion on the Use of ICT Tools

Parameter	AVMC		MGMC&R		PIMS		Total		Percentage	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Internet	38	0	30	3	35	2	103	5	85.83	4.17
Phone	34	3	3	23	25	7	62	33	51.67	27.50
Fax	12	4	1	23	8	15	21	42	17.50	35.00
Video conference	30	5	1	22	5	16	36	43	30.00	35.83
Document scanners	23	5	1	22	4	15	28	42	23.33	35.00
Mobile phone	30	3	13	3	20	8	63	14	52.50	11.67
Digital camera	23	4	2	22	12	16	37	42	30.83	35.00
Webcam	7	5	1	23	8	17	16	45	13.33	37.50
Audio & Video Player	24	1	2	23	22	15	48	39	40.00	32.50
Laser printer	20	1	1	24	22	15	43	40	35.83	33.33
Multimedia Projector	9	5	1	24	12	17	22	46	18.33	38.33
RFID Technology	15	5	0	24	0	18	15	47	12.50	39.17
Barcode scanner	27	13	12	8	5	24	44	45	36.67	37.50
WiFi	37	3	31	5	30	8	98	16	81.67	13.33

Table 5 Distribution of the Availability of ICT based Services

Service	Responses			Total	Percentage
	AVMC	MGMC&R	PIMS		
TOC	9	14	_	23	19.17
SDI	21	8	_	29	24.17
Circulation of new additions list	8	19	3	30	25.00
Electronic document delivery	8	6	_	14	11.67
Multimedia service	27	14	10	51	42.50
CD/DVD based service	15	18	15	48	40.00
Online databases	23	22	20	65	54.17
Web OPAC	8	25	_	33	27.50
E-journals	33	2	30	65	54.17
E-books	36	9	33	78	65.00
Library website	28	22	28	78	65.00
Internet services	31	7	35	73	60.83

5.6 Opinion on the ICT Infrastructure

Table 6 shows the opinion on the satisfaction level of respondents with the ICT infrastructure facility. Among the total number of 40 respondents from AVMC, 30(75%) respondents stated that they were normally satisfied, 6(15%) respondents stated that highly satisfied, 4(10%) respondents stated that they were dissatisfied. Out of 40 respondents from MGMC&R, 22 (55%) respondents stated that they were normally satisfied, 9 (22.5%) respondents stated that partially satisfied, 7 (17.5%) respondents stated as dissatisfied, 2 (5%) respondents stated as highly satisfied. Among the total number of 40 respondents from PIMS, 18 (45%) respondents stated that they were normally satisfied, 10 (25%) respondents stated as highly satisfied, 7 (17.5%) respondents stated as partially satisfied, 5(12%) respondents stated as dissatisfied. The overall opinion revealed the fact that out of 120 respondents, 70 (58.33%) respondents stated that they were normally satisfied, 18 (15%) respondents stated as highly satisfied, 16 (13.33%) respondents stated as partially satisfied and dissatisfied. Though the percentage of the respondents who were partially satisfied and dissatisfied is low (13.33%), proper care must be taken by the libraries to increase the level of satisfaction optimally.

Table 6 Distribution of Satisfaction Level with the ICT Infrastructure Facility

Response	AVMC	MGMC&R	PIMS	Total	%
Highly satisfied	6(15%)	2(5%)	10(25%)	18	15
Partially satisfied	---	9(22.5%)	7(17.5%)	16	13.33
Normally satisfied	30(75%)	22(55%)	18(45%)	70	58.33
Dissatisfied	4(10%)	7(17.5%)	5(12%)	16	13.33
Total	40(100%)	40(100%)	40(100%)	120	100

5.7 Purpose of Using ICT Tools and Services

Table 7 presents the results of opinion on the purpose of using ICT tools and services. The result indicates that 32 respondents, in the case of AVMC used for research purposes followed by Participation in seminars/ conferences (31), Preparation for special lectures (30), Current developments (28), Share ideas with subject experts and learn the information about govt. decision (8 each). In the case of MGMC&R, 25 respondents used for Participation in seminars/ conferences and Current developments followed by Preparation for special lectures (24), Research purposes (22) and so on. On the other hand, 32 respondents, in the case of PIMS used for Research purposes followed by Participation in seminars/ conferences, Preparation for special lectures and Current developments (28 each), Share ideas with subject experts (12), learn the information about govt. decision (10). On the whole it was observed that Research purposes were found to be the most used option for respondents on the purpose of using ICT tools and services which amounts to 71.67 percent. The other purposes of using ICT tools and services include Participation in seminars/conferences (70%), preparation for special lectures (68.33%), Current developments (67.50%), Learn the information about govt. decision (20%), and share ideas with subject experts (18.33%).

Table 7 Purpose of Using ICT Tools and Services

Parameter	AVMC		MGMC&R		PIMS		Total		Percentage	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Research Purposes	32	---	22	9	32	5	86	14	71.67	11.67
Participation in Seminars/Conferences etc.	31	6	25	9	28	10	84	25	70.00	20.83
Preparation for special lectures/public speeches etc.	30	1	24	9	28	7	82	17	68.33	14.17
Share ideas with subject experts	8	6	2	21	12	15	22	42	18.33	35.00
Learn the information about govt. decision on R&D	8	3	6	16	10	12	24	31	20.00	25.83
Current developments	28	3	25	13	28	8	81	24	67.50	20.00

5.8 Use of Web Tools

Table 8 presents the results of opinion on using web tools. There are number of web based tools available for different purposes like creating blogs, social networking, RSS, etc. The result highlights that 27 respondents from AVMC frequently used social networking tools (Face book, Orkut, Twitter, etc.), followed by Wikipedia (25), E-mail/chat (24), Audio & video sharing/webcasting (23), Blogging (22) and RSS feeds (16). It was found that 17 respondents from MGMC&R frequently used Audio & video sharing/ webcasting tool followed by Discussion group and Social networking (13), E-mail/chat (11) and so on. It was also observed that 22 respondents from PIMS frequently used E-mail/chat and Wikipedia tool, followed by Audio & video sharing/webcasting and Discussion group (15) and so on. However, it was altogether observed that majority of respondents frequently used the web based tools. It is evident that 47.5% of respondents use frequently the E-mail, and Wikipedia respectively. The other frequently used web tools were Social networking (45%), Discussion groups (41.67), Blogging (25.83), and RSS feeds (17.50). On the other hand, it was found that

majority of respondents used rarely with a percentage ranging between 50% and 25%. It was also found that a low percentage of respondents have never used web tools.

5.9 Preference of Medical Related Software Tools

An attempt was made to analyse the opinion of respondents on the preference of medical related software tools in the selected libraries using Likert's five point scale. As can be seen in Table 9, the result revealed that the sources with the opinion of very high level adequacy includes FreeMED (43.33%) followed by Clear health (24.16%); ZEPRS (23.33%) and so on. The responses with high level preference were reference sources such as Xebra (22.5%) followed by FreeMED, Hospital OS and DHIS (9.16% each); Open ERP and In Vasalius 3D (18.33% each) and so on. With regard to moderate preference, th responses were received for GIMIAS (43.33%) followed by Mirth (34.16%); OpenMRS (33.33%) and so on. On the other hand, the low level response on the adequacy of software was also received. The low level and very low level respondents were GNUmed (6.66 %) followed by FreeMED, Hospital OS, Open ME (4.16% each); DHIS (9.16%), GIMIAS (8.33%) and so on.

6. MAJOR FINDINGS

The study conducted based on the three medical colleges in Puducherry lead to the following major findings:

i. Use of E-resources witnessed that E- textbooks were found to be the most used E-resources which accounts for 70 percent. The other used resources include E-reference books and E-journals (56.67% each), E-magazines and E-newspaper (42.5% each), E-theses and CD/DVD (31.67% each).
ii. Internet was found to be the prevalently used ICT tools which accounts for 85.83 percent. The other used tools include Wireless internet (81.67%), Mobile phone (52.50%), Phone (51.67%), MP4 player (40%), Barcode scanner (36.67%) and so on.
iii. Maximum number of 78 (65%) respondents was using E-books and Library website, followed by Internet services (60%), Online database and E-Journals (54.17%), Multimedia service (42.5%) Web OPAC (27.50%) and so on.
iv. Research purposes were found to be the most used option for respondents on the purpose of using ICT

Table 8 Distribution of Web Tools by Frequently of Use

Parameter	AVMC			MGMC&R			PIMS			Total			Percentage		
	Frequently	Rarely	Never	Frequently	Rarely	Never	Frequently	Rarely	Never	Frequently	Rarely	Never	Frequently	Rarely	Never
Blogging(e.g. Twitter, weblogs)	22	8	4	2	10	25	7	12	12	31	30	41	25.83	25	34.17
Audio/video sharing(webcasting (e.g. YouTube, Skype)	23	5	3	17	14	3	15	4	4	55	23	10	45.83	19.17	8.33
E-mail/chat	24	5	0	11	13	12	22	4	4	57	22	16	47.50	18.33	13.33
Discussion groups (e.g. Google/ Yahoo!)	22	5	1	13	14	4	15	7	7	50	26	12	41.67	21.67	10
Social Networking(e.g. Orkut, Facebook)	27	3	3	13	6	14	14	10	10	54	19	27	45.00	15.83	22.5
RSS feeds	16	5	6	0	7	25	5	15	15	21	27	46	17.50	22.5	38.33
Wikis(e.g. Wikipedia, LISWiki)	25	3	3	10	18	4	22	4	4	57	25	11	47.50	20.83	9.17

Table 9 Distribution of Respondents by Preference of Medical Related Software Tools

Parameter	AVMC					MGMC&R					PIMS					Total					Percentage				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
FreeMED	27	6	3	1	0	18	2	10	1	1	7	3	10	3	2	52	11	23	5	3	43.33	9.16	19.16	4.16	2.5
GNUmed	18	5	3	1	0	5	0	15	4	5	2	1	15	3	2	25	6	33	8	7	20.83	5	27.5	6.66	5.83
Hospital OS	4	22	2	1	0	7	1	0	0	1	5	0	15	4	2	16	23	17	5	3	13.33	19.16	14.16	4.16	2.5
Mirth	1	5	27	1	0	3	0	2	4	4	3	1	12	1	5	7	6	41	6	9	5.83	5	34.16	5	7.5
OpenEMR	1	3	21	0	0	8	0	12	3	4	5	0	12	1	5	14	3	45	4	9	11.66	2.5	37.5	3.33	7.5
OpenMRS	0	3	18	1	0	7	0	10	3	4	4	1	12	1	5	11	4	40	5	9	9.16	3.33	33.33	4.16	7.5
OCSAR McMaster	4	2	18	1	0	0	0	12	4	4	4	2	12	1	5	8	4	42	6	9	6.66	3.33	35	5	7.5
THIRRA	2	5	22	0	0	2	3	6	3	4	2	1	12	1	5	6	9	40	4	9	5	7.5	33.33	3.33	7.5
VistA	17	3	5	0	0	2	2	7	3	3	4	1	13	1	5	23	6	25	4	8	19.16	5	20.83	3.33	6.66
ZEPRS	23	3	0	0	2	1	0	13	4	5	4	0	14	1	5	28	3	27	5	12	23.33	2.5	22.5	4.16	10
Open ERP	0	22	2	0	0	0	0	8	5	4	1	0	13	1	5	1	22	23	6	9	0.83	18.33	19.16	5	7.5
Clear Health	18	2	4	0	0	8	2	7	3	5	3	0	13	1	5	29	4	24	4	10	24.16	3.33	20	3.33	8.33
MedinTux	4	20	2	0	0	5	0	6	4	5	3	0	12	1	5	12	20	20	5	10	10	16.66	16.66	4.16	8.33
DHIS	1	20	5	1	0	0	0	8	3	6	1	3	12	1	5	2	23	25	5	11	1.66	19.16	20.83	4.16	9.16
InVesalius 3D	2	20	3	0	0	3	0	6	2	4	5	2	11	1	5	10	22	20	3	9	8.33	18.33	16.66	2.5	7.5
Xebra	4	20	4	0	0	0	4	11	3	4	2	3	11	1	5	6	27	26	4	9	5	22.5	21.66	3.33	7.5
GIMIAS	3	3	23	0	0	0	1	17	3	5	3	2	12	1	5	6	6	52	4	10	5	5	43.33	3.33	8.33

1-Very high level, 2-High level, 3- Neutral, 4-Low level, 5-Very low level

tools and services which amounts to 71.67 percent. The other reasons for using ICT resources and services include Participation in seminars/ conferences (70%), preparation for special lectures (68.33%), Current developments (67.50%), Learn the information about govt. decision (20%), share ideas with subject experts (18.33%).

v. It was found that 47.5% of respondents used frequently the E-mail and Wikipedia respectively. The other frequently used web tools were Social networking sites (45%), Discussion groups (41.67%), Blogging (25.83%), and RSS feeds (17.50%).

vi. The sources with the opinion very high level adequacy includes FreeMED (43.33%) followed by Clear health (24.16%); ZEPRS (23.33%) and so on. The responses with high level preferences were reference sources such as Xebra (22.5%) followed by FreeMED, Hospital OS and DHIS (9.16% each); Open ERP and In Vasalius 3D (18.33% each) and so on. With regard to moderate responses were received for GIMIAS (43.33%) followed by Mirth (34.16%); OpenMRS (33.33%) and so on.

7. CONCLUSION

Based on the outcomes of the study, it is evident that majority of the respondents from all the three institutions made use of the ICT based resources and services significantly. The ICT has eliminated the barriers in utilizing these services and had high impact on the process of medical education and research. So the investments made by the selected institutions on ICT based resources and services are quite considerable and cost effective. However, the institution with the help of librarians needs to think of promoting the awareness and utilization of these resources and services available in the

respective institutions among the users who are not utilizing these facilities. Making this effort would definitely witness the optimum utilization of ICT based resources and services which in turn leads to higher productivity of research, quality learning and best assured services to the society.

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Research Publication Trends among the Faculty Members of Bharathidasan University: A Scientometric Study

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Abstract

Bibliographic records of 2982 items retrieved from Web of Science were studied and increasing publication trends were seen in Bharathidasan University (BDU). The average output of the organization was 87 publications per year; the peak was 269 items in 2013 and the minimum was only one item in the year1981. It was seen that the publications of Bharathidasan University received a total of 4763 citations during the period of 14 years. The average citation per item was 5.7.

Keywords: *Bibliometrics, Collaboration Pattern, Publication Density, Scientometrics.*

1. INTRODUCTION

Metrics studies plays an important role in understanding the growth of a discipline and assist in designing national policies for implementation and improving the research level of their institutions/ organizations. Most of the metrics studies use online databases for retrieving published literature for the analysis. Scientometrics is the science of measuring and analyzing science research. In practice, scientometrics is often done using bibliometrics, which is a measurement of the impact of (scientific) publications. Similar scientific fields are Bibliometrics, Informetrics, Webometrics, Virtual ethnography and Web mining. This study is an attempt made to analyze the research output of Bharathidasan University towards international science using different metrics.

2. OBJECTIVES OF THE STUDY

i. To find out the year wise distributions of authorship pattern
ii. To find out the Author Productivity
iii. To identity the Country wise distribution of publications
iv. To identify the degree of Collaboration
v. Mapping of highly cited papers

3. METHODOLOGY

For our study data were downloaded from Web of Science database. Here we have used the search techniques to download the data. First we enter the database and we type "Bharathidasan University" in the address field, study period chosen for this study is 34 years that is from (1981-2014). Vosviewer open source computer program used for the mapping of the analyzed data.

4. ANALYSIS

Following tables represent the quantitative performance of Bharathidasan University towards international science through different metrics

4.1 Year-wise Distribution of Publications

The distribution of 2982 items by publication year revealed rising publication trend only after 2002. The average output of the organization was 87 publications per year; the peak was 269 items in 2013 and the minimum was 1 item in the year 1981.

Table 1 Year-wise Distribution of Publications

Sl.No.	Year	Recs	Cum	Rec %	Cum %	TLCS	TGCS
1	1981	1	1	0.03	0.03	0	0
2	1982	6	7	0.20	0.23	5	14
3	1983	19	26	0.64	0.87	32	97
4	1984	13	39	0.44	1.31	25	138
5	1985	14	53	0.47	1.78	28	144
6	1986	29	82	0.97	2.75	38	292
7	1987	27	109	0.91	3.66	19	107
8	1988	28	137	0.94	4.59	20	166
9	1989	21	158	0.70	5.30	12	65
10	1990	19	177	0.64	5.94	28	208
11	1991	22	199	0.74	6.67	58	227
12	1992	33	232	1.11	7.78	116	460
13	1993	29	261	0.97	8.75	105	605
14	1994	46	307	1.54	10.30	169	936
15	1995	42	349	1.41	11.70	162	873
16	1996	57	406	1.91	13.62	148	624
17	1997	65	471	2.18	15.79	208	1019
18	1998	63	534	2.11	17.91	222	1213
19	1999	55	589	1.84	19.75	116	475
20	2000	55	644	1.84	21.60	92	820
21	2001	65	709	2.18	23.78	211	971
22	2002	89	798	2.98	26.76	279	1130
23	2003	122	920	4.09	30.85	521	1568
24	2004	117	1037	3.92	34.78	297	2131
25	2005	135	1172	4.53	39.30	306	1649
26	2006	143	1315	4.80	44.10	346	1655
27	2007	137	1452	4.59	48.69	219	1525
28	2008	135	1587	4.53	53.22	222	1488
29	2009	186	1773	6.24	59.46	288	1947
30	2010	196	1969	6.57	66.03	202	1158
31	2011	290	2259	9.73	75.75	213	1694
32	2012	259	2518	8.69	84.44	168	958
33	2013	269	2787	9.02	93.46	100	454
34	2014	195	2982	6.54	100.00	11	26

4.2 Authorship Pattern of Contributors

Table 2 Authorship Pattern of Contributions

Year	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	Sum
Single	0	0	1	1	2	1	2	3	5	1	1	1	2	0	1	4	4	0	1	30
Double	0	6	17	12	10	24	21	19	15	16	9	21	21	18	21	32	40	31	24	357
Triple	1	0	1	0	1	1	3	4	1	0	9	5	4	12	12	7	16	8	14	99
Four	0	0	0	0	1	2	0	2	0	2	3	5	2	9	8	9	3	15	10	71
Five	0	0	0	0	0	1	1	0	0	0	0	1	0	4	0	4	2	3	4	20
Six	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	4	0	7
Seven	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
Eight	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	3
Nine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ten	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**1**	**6**	**19**	**13**	**14**	**29**	**27**	**28**	**21**	**19**	**22**	**33**	**29**	**46**	**42**	**57**	**65**	**63**	**55**	**589**

Year	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	Sum
Single	3	9	2	2	3	3	5	4	4	7	3	2	4	3	3	57
Double	21	19	31	22	32	37	20	40	31	43	46	45	45	55	31	518
Triple	12	10	9	21	21	24	36	35	31	45	42	58	60	57	33	494
Four	10	10	17	39	26	32	39	27	30	33	35	63	48	45	38	492
Five	5	12	20	21	19	23	36	20	15	21	33	63	39	28	32	387
Six	0	4	6	14	14	10	3	5	16	14	16	21	26	33	23	205
Seven	3	1	2	2	1	3	1	2	4	13	15	11	12	13	13	96
Eight	1	0	0	0	0	2	2	2	2	8	4	11	9	11	8	60
Nine	0	0	0	1	1	0	1	1	1	1	1	5	9	10	4	35
Ten	0	0	2	0	0	1	0	0	0	1	0	4	0	5	3	16
>10	0	0	0	0	0	0	0	1	1	0	1	7	7	9	7	33
Total	**55**	**65**	**89**	**122**	**117**	**135**	**143**	**137**	**135**	**186**	**196**	**290**	**259**	**269**	**195**	**2393**

Table 3 Consolidated Authorship Pattern of Contributions

Year	1981-1990	1991-2000	2001-2014	Total
Single	16	17	54	87
Double	140	238	497	875
Triple	12	99	482	593
Four	7	74	482	563
Five	2	23	382	407
Six	0	7	205	212
Seven	0	5	93	98
Eight	0	4	59	63
Nine	0	0	35	35
Ten	0	0	16	16
>10	0	0	33	33
Total	-	-	-	**2982**

4.3 Degree of Collaboration

Various methods have been the degree methods proposed to calculate the degree of research collaboration. Here in this study the formula proposed by Subramanyam (1983) has been used.

DC= $Nm/N_m + N_s$

Where, DC = Degree of Collaboration
Nm = Number of Multiple Authored Papers
Ns = Number of Single Authored Papers
Therefore, DC=2703/2703+84-0.96

Compound Annual Growth Rate (CAGR)

CAGR= (End Value/Beginning Value) $^{(1/No.\ of\ Years)}$ **-1**

CAGR $= ((195/1)^{1/34} - 1$
$= 5.73-1$
$= 4.73$

4.4 Document-wise Distribution of Publications

Here, documents are arranged according to their types. In this count, Journal articles account for 90.5% share, and the predominate share in the distribution followed by Note(2.2%) and the remaining 7.3 % had appeared in many other publication types viz. Review, Letter, Proceedings, Meeting Abstract etc. (Table-2).

Table 4 Document-wise Distribution

Sl.No.	Document Type	Recs	%	TLCS	TGCS
1	Article	2699	90.5	4675	24442
2	Note	66	2.2	65	387
3	Review	61	2.0	131	1415
4	Letter	55	1.8	51	228
5	Article; Proceedings Paper	41	1.4	62	338
6	Meeting Abstract	29	1.0	0	0
7	Correction	14	0.5	0	1
8	Editorial Material	11	0.4	2	26
9	News Item	4	0.1	0	0
10	Book Review	1	0.0	0	0

4.3 Author-wise Distribution of Bharathidasan University

Table 5 Top 15 Authors of Bharathidasan University

Sl.No.	Author	Dep	Recs	Percent	TLCS	TGCS	TLCR	h-Index
1	Lakshmanan M	Phy	231	7.7	645	4178	508	35
2	Muthiah PT	Scho of Chem	139	4.7	497	1064	482	17
3	Ramamurthi K	Scho of Phy	123	4.1	140	923	153	14
4	Palaniandavar M	Chem	122	4.1	592	3467	566	32
5	Parthasarathi V	Life Sci	113	3.8	191	367	169	9
6	Venuvanalingam P	Scho of Chem	97	3.3	154	709	153	17
7	Akbarsha MA	Life Sci	94	3.2	159	954	256	16
8	Renganathan R	Scho of Chem	92	3.1	177	1209	173	21
9	Balasundaram C		90	3.0	157	681	158	14
10	Ganapathi A	Bio Tech	80	2.7	110	509	108	13
11	Dhanuskodi S	Phy	77	2.6	133	823	122	17
12	Arumugam S	Scho of Phy	73	2.4	19	283	18	8
13	Geraldine P	Animal Sci	72	2.4	110	669	104	16
14	Archunan G	Life Sci	69	2.3	143	334	146	11
15	Panchanatheswaran K	Scho of Chem	67	2.2	81	473	84	12

4.5 Map Based on Networking

Table 6 shows the Bibliographic Coupling - Authors of BDU & Fig 2 shows the label view of Author wise Distributions

Author	Documents	Bib.coupling
Lakshmanan M	231	4722.88
Muthiah PT	139	2871.94
Palaniandavar M	124	6398.50
Ramamurthi K	123	2733.35
Parthasarthi V	113	1415.44
Venuvanalingam P	97	3803.09
Akbarsha MA	94	3598.34
Renganathan R	92	3538.60
Balasundaram C	90	5187.14
Ganapathi A	80	2407.36
Dhanuskodi S	77	1253.64
Arumugam S	73	1161.73
Geraldine P	72	3192.70
Archunan G	69	2277.35
Panchanatheswaran K	67	1100.50

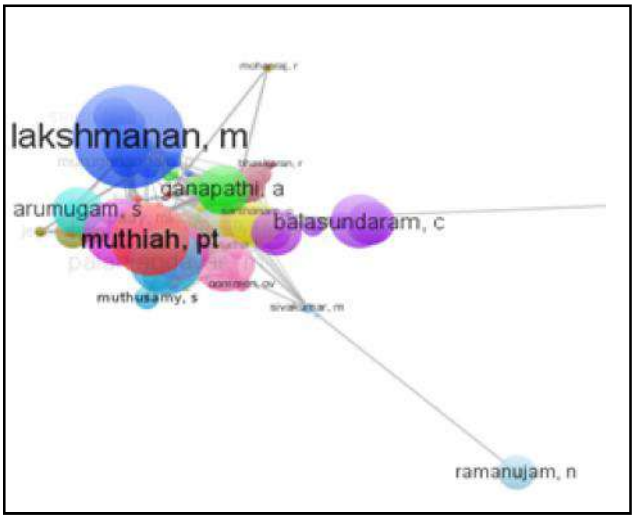

Fig. 3 Cluster Density View - Authors of BDU

Table 6 and figure 2&3 shows the Bibliographic Coupling of Authors of the Bharathidasan University. Both the cluster density view and label view also shown above using the Vos Viewer. From the analysis we came to the conclusion that M. Lakshmanan, Department of Physics has highest number of records 231 and h index of 35 followed by PT. Muthiah Department of school of chemistry has next highest publication of 139 and h index of 17 but M.Palaniandavar, Department of chemistry has 124 records with h index of 32.

4.6 Journal-wise Distribution of Documents

Table 7 Top 15 Journals of Bharathidasan University

Sl.No	Journals	Records	Percent	TLCS	TGCS	TLCR
1	Acta Crystallographica Section E-Structure Reports Online	218	7.3	614	895	580
2	Current Science	99	3.3	68	326	43
3	Acta Crystallographica Section C-Crystal Structure Communications	87	2.9	227	489	150
4	Spectrochimica Acta Part A-Molecular And Biomolecular Spectroscopy	72	2.4	84	566	131
5	Physics Letters A	48	1.6	89	555	116
6	Physical Review E	46	1.5	85	1114	71
7	Indian Journal of Chemistry Section B-Organic Chemistry Including Medicinal Chemistry	37	1.2	59	194	96
8	International Journal of Bifurcation And Chaos	35	1.2	70	382	79

9	Journal Of Mathematical Physics	35	1.2	107	602	97
10	Tetrahedron Letters	29	1.0	59	173	61
11	Journal of Environmental Biology	28	0.9	20	98	30
12	Journal of Physics A-Mathematical And General	28	0.9	97	528	57
13	Dalton Transactions	27	0.9	85	377	206
14	Polyhedron	27	0.9	92	536	92
15	Colloids And Surfaces B-Biointerfaces	26	0.9	60	318	45

Table 8 Bibliographic Coupling of Sources & Figure 4 Label View of Bibliographic coupling of Sources

Source	Documents	Bib.coupling
Acta Crystallographica section e-struct…	218	1647.13
Current science	99	245.87
Acta Crystallographica section c-crystal…	87	1343.10
Spectrochimica acta part a-molecular a…	72	952.88
Physics letters a	48	808.08
Physical review e	46	884.84
Indian journal of chemistry section b-or…	37	226.85
International journal of bifurcation and …	35	520.09
Journal of mathematical physics	35	568.19
Tetrahedron letters	29	273.95
Journal of enviornmental biology	28	135.90
Journal of physics a-mathematical and..	28	309.93

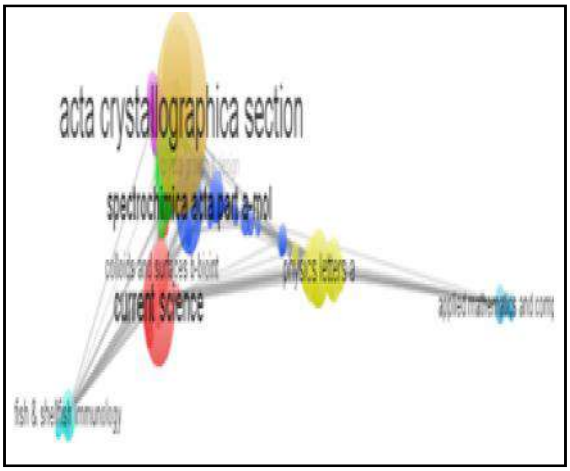

Table 8 and figure 4 shows the bibliographic coupling of the sources and its label view. Among various sources acta crystallograhica has highest documents and also having highest bibliographic coupling rate, followed by this current science has next highest number of documents and so on.

Table 10 and figure 5 shows the bibliographic coupling and the label view of organization wise distribution. Here the anna university has highest publications of 55 with the Bharathidasan University, next to that Madurai Kamaraj university has documents of 50 followed by university of madras has 47 and so on.

Table 11 and figure 6 shows the Co-Authorship of authors and label view of Authors. Author M. Lakshmanan has 231 documents has the co-authorships of 208 followed by Pt. Muthaih has 139 documents with 126 and so on.

4.7 Organization-wise Distribution of Documents

Table 9 Top 15 Organization-wise Distribution of Documents

Sl.No.	Institution	Records	TLCS	TGCS
1	Anna University	55	37	286
2	Madurai Kamaraj University	50	41	106
3	University Madras	47	64	316
4	Indian Institute of Science	46	104	529
5	Joseph Eye Hospital	39	47	363
6	Cheju National University	38	87	309
7	Punjab University	38	88	123
8	University of Zurich	38	94	225
9	Annamalai University	36	13	146
10	Cent ral Salt & Marine Chemical Research Institute	36	132	495
11	Indian Institute of Technology	36	30	275
12	University of Neuchatel	32	65	584
13	National Institute of Technology	31	32	194
14	SRM University	31	19	89
15	Bharathiar University	30	17	204

Table 10 Bibliographic Coupling of Organization

Organization	Documents	Bib.coupling
Bharathidasan Uni.	2694	47000.50
Anna Uni.	55	2003.69
Maduraikamaraj Uni.	50	1709.11
Univ. Madras	47	1684.82
Indian Inst. Sci.	46	1586.42
Joseph eye hosp.	39	2091.29
Cheju natl. Uni.	38	2627.69
Panjab Uni.	38	587.27
Uni. Zurich	38	1012.80
Cent Salt & marine chem. Res inst	37	2944.29
Annamalai Uni.	36	1019.65
Indian Inst. TEchnol.	36	1046.48
Uni. Neuchatel	32	1376.14
Natl. inst. Tech.	31	1164.73
SRM Uni.	31	1128.93

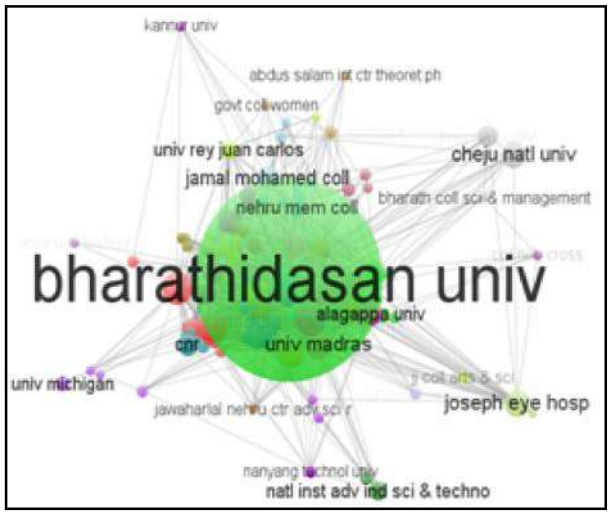

Fig. 5 Label View - Bibliographic Coupling of Organization

5. FINDINGS AND SUGGESTIONS

i. There is no much variation in the early output up to 2000 but from 2002 onwards there is significant development in the research output of the Bharathidasan University but as compare to the other Research Institution/ Organization we have to still improve research performance in the productivity.

ii. Contribution of multiple authors is dominating with major contribution of double and three authors; so there is a need of promoting further collaboration.

Table 11 Co-authorship of Authors

Author	Documents	Bib.coupling
Lakshmanan M	231	208.00
Muthiah PT	139	126.00
Palaniandavar M	124	104.00
Ramamurthi K	123	118.00
Parthasarthi V	113	112.00
Venuvanalingam P	97	87.00
Akbarsha MA	94	70.00
Renganathan R	92	89.00
Balasundaram C	90	81.00
Ganapathi A	80	75.00
Dhanuskodi S	77	74.00
Arumugam S	73	64.00
Geraldine P	72	66.00
Archunan G	69	57.00
Panchanatheswaran K	67	63.00

6. CONCLUSION

Research Productivity in the Bharathidasan University among the faculty is significantly high. Though the study started in recent decade but there is really an optimistic growth in the research productivity. Production is the real asset for our institution but as compare to other organization/ Institution still we need to improve the research performance in a way enormous way.

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Management Information System Research Output : A Scientometric Study

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Abstract

In this study an attempt to quantitatively analyze has been made the research trends in Management Information System with the help of scientific publications reflected in the popular database web of science during the period 1989 to 2013 (totally 25 years)of this paper presents a study of productivity, characteristics and various aspects of global publication in the field of Management Information System research output. The active author is "Huang GH" from China Agricultural University. Majority of articles are from the two, three and four authors team which are really a positive aspect in collaboration. Highest contributing authors are in three authors team. The highest exponential growth rate is 4.32 percents found during the year 1991.

***Keywords**: Authorship Pattern, Degree of Collaboration, Scientometric / bibliometric, h-Index.*

1. INTRODUCTION

Management Information System is a superset of Boolean logic that handles the concept of partial truth, which is a truth value between "completely true" and "completely false". Management Information System is multivalve. It deals with degrees of membership and degrees of truth. 'Scientometrics' is the branch science of science that describes the output traits in terms of organizational research structure, resource inputs and outputs, develops benchmarks to evaluate the quality of information output. Scientometric research publications are a quantitative measure for the basic research activity in a country.

2. OBJECTIVES OF THE STUDY

i. To measure the Authors productivity
ii. To examine the year wise productivity and authorship patterns and the nature of collaborative research
iii. To identify the degree of collaboration
iv. Number of articles with their citation scores

3. DATA AND METHODOLOGY

The present study attempts to find out the publication pattern of researchers in the field of Management Information System. The study is based on the references and aims to analyze quantitatively the growth and development of Management Information System in global level in terms of publication output as reflected in Web of Science database during years, 1989 - 2013. Web of Science is the largest abstract and citation database of research literature and quality web only journals. It's designed to enable not only the researchers for accessing scientific information but provide the information scientists to study the literature for different information analyses purposes. Quick, easy and comprehensive, Web of Science provides superior support of the literature research process. The study period 1989 to 2013 is selected as the database is available. A total of 45355 records were downloaded and analyzed by using the Histcite software application analyzed and tabulated for making observations as per the objectives of the study.

Table 1 Management Information System Research Output during 1989 to 2013

1	Records	45355
2	Time Span	1989 - 2013
3	Contributed authors	156817
4	Contributed journals	6637
5	Document types	19
6	Languages	30
7	Contributing countries	182
8	Institutions	23486
9	Local References	14344
10	Global references	1184907
11	Local citations	56970
12	Global citations	601598
13	H - index	1447

Table 1 reveals that the brief description about the MIS research output during the sample period from the web of science database. the total time span is 25 years, 453555 records were downloaded. among those records were earned 601598 citation scores and 1447 h-index values. 30 different types of languages were produced through 19 different types of document were produced the sample records, among those 6637 are in the type of journal format. 182 countries were contributed through 23486 different types of institutions about the MIS research output.

4. RELATIVE GROWTH RATE AND DOUBLING TIME

The analysis of growth rate in MIS research output is one of the important aspects of discussion. Hence the provision of information to information seekers is the prime duty of library professionals, who have to meet the information needs of scientists in various disciplines and policy making. In this connection, the published literature is taken as a target to measure the knowledge in a discipline, and the growth rate study of publications would provide some useful results.

Table 2 Relative Growth Rate and Doubling time of the Research Output in Management Information System

Year	R. o/p	$\log_e 1^p$	$\log_e 2^p$	Rt(P)	Dt(P)
1989	49	-	3.892	-	-
1990	129	3.892	5.182	1.290	0.54
1991	557	5.182	6.531	1.349	0.51
1992	684	6.531	7.124	0.593	1.17
1993	725	7.124	7.251	0.127	5.46
1994	935	7.251	7.415	0.164	4.23
1995	910	7.415	7.520	0.106	6.56
1996	978	7.520	7.543	0.023	30.08
1997	1051	7.543	7.615	0.072	9.62
1998	1083	7.615	7.666	0.050	13.73
1999	1238	7.666	7.750	0.084	8.25
2000	1382	7.750	7.871	0.121	5.72
2001	1377	7.871	7.923	0.052	13.41
2002	1558	7.923	7.984	0.062	11.21
2003	1861	7.984	8.137	0.153	4.54
2004	1998	8.137	8.258	0.121	5.72
2005	2136	8.258	8.327	0.069	10.07
2006	2399	8.327	8.420	0.093	7.49
2007	2579	8.420	8.513	0.093	7.44
2008	2898	8.513	8.608	0.096	7.25
2009	3273	8.608	8.728	0.119	5.81
2010	3439	8.728	8.812	0.084	8.25
2011	3815	8.812	8.889	0.078	8.92
2012	4000	8.889	8.964	0.074	9.30
2013	4301	8.964	9.024	0.060	11.49
Total	**45355**			**5.132 (0.21)**	**196.76 (7.87)**

Table 2 predicts data of relative growth rate and doubling time for total research output on MIS. The analysis of MIS research output at International visual aid provides the following facts: It is observed that its relative growth rates have contradicted progressively from 1.290 at 1990 to 0.06 in the year 2013. During the whole study period sample mean relative growth rate is 5.132 and its average value is 0.21. Contrary to this, the 'Doubling Time' for publication of all sources in MIS research output has increased from 0.54 years at 1990 to 11.49 years at 2013. During the study period doubling time value is 7.87 years. Hence the doubling of research literature is of 8 years in MIS.

5. AUTHORSHIP PATTERN

Table 3 reflects the collaborative pattern of authors involved in Management Information System research. totally 45355 articles were taken for this study; among those only 7174 articles were produced by single authors; 11306 articles were produced by two authors team; 10334 articles were produced by three authors team; 6667 articles were produced by four authors team; 3877 articles were produced by five authors team; 2148 articles were produced by six authors team; 1322 articles were produced by seven authors team; 813 articles were produced by eight authors team; 489 articles were produced by nine authors team; and 1225 articles were produced by ten above authors team.

Table 3 Authorship Patterns of Management Information System Research Output during 1989 to 2013

Author/ Year	1 Author	2 Author	3 Author	4 Author	5 Author	6 Author	7 Author	8 Author	9 Author	10 & above	TOTAL
1989	26	10	9	1	2	0	0	0	1	0	49
1990	54	39	20	8	5	2	1	0	0	0	129
1991	196	158	109	50	21	10	4	4	1	4	557
1992	235	211	124	61	24	9	7	4	0	9	684
1993	238	235	133	51	27	16	7	6	2	10	725
1994	281	276	186	84	53	25	16	2	5	7	935
1995	300	253	191	75	37	24	13	8	5	4	910
1996	280	297	203	94	48	26	10	7	3	10	978
1997	278	309	227	117	52	27	10	10	8	13	1051
1998	244	317	230	122	83	38	21	14	0	14	1083
1999	285	388	247	149	88	39	18	9	2	13	1238
2000	318	373	302	157	100	57	19	20	14	22	1382
2001	290	389	297	171	103	46	27	18	15	21	1377
2002	312	425	361	206	96	61	36	26	11	24	1558
2003	350	490	416	245	124	77	59	35	21	44	1861
2004	303	532	466	291	162	95	54	30	19	46	1998
2005	299	566	513	326	182	81	59	40	16	54	2136
2006	340	641	540	348	189	130	73	49	23	66	2399
2007	354	662	611	358	211	125	99	66	25	68	2579
2008	380	713	649	459	263	153	79	58	47	97	2898
2009	372	794	769	543	298	181	97	67	47	105	3273
2010	386	777	806	575	336	191	117	65	44	142	3439
2011	410	766	901	669	405	218	147	85	60	154	3815
2012	319	824	997	724	445	238	169	96	55	133	4000
2013	324	861	1027	783	523	279	180	94	65	165	4301
Total (articles)	**7174**	**11306**	**10334**	**6667**	**3877**	**2148**	**1322**	**813**	**489**	**1225**	**45355**
Authors	**7174**	**22612**	**31002**	**26668**	**19385**	**12888**	**9254**	**6504**	**4401**	**16929**	**156817**

From this table analysis the researcher has identified the two authors team has produced highest number of articles. The table shows that more than 50% of the contribution came from double, three and four authors which are really a positive aspect in collaboration.

6. MOST PRODUCTIVE AUTHORS

The below table shows that the most productive authors in the field of MIS research output during 1989 to 2013. Table 4 reveals the contribution of top 10 most productive authors in Management Information System research.

"Huang GH", College of Water Resources & Civil Engineering, China Agricultural University, has the top list with the contribution of 119 records, h-Index (26), TLCS and TGCS are 568 and 3016 citations respectively. Followed by "Lee S", has second highest productivity of Management Information System output 76 records, h-Index (13), TLCS and TGCS 133 and 677 citations respectively. The researcher has identified the active author is **"**Huang GH".

Table 4 Top 10 Most Productive Authors in Management Information System Research Output

Sl. No.	Author	Records	TLCS	TGCS	h-Index
1	Huang GH	119	568	3016	26
2	Lee S	76	133	677	13
3	Lee J	60	60	470	12
4	Kim S	57	32	358	9
5	[Anonymous]	50	0	0	0
6	Li L	47	165	584	15
7	Liu Y	47	28	206	8
8	Klein G	46	217	535	14
9	Zhang L	46	30	636	12
10	Liu L	45	72	633	12

7. DEGREE OF COLLABORATION

A study of data from the above table 5 indicates the degree of collaboration in research output of Management Information System. The degree of collaboration is 0.84 during the study period 1989 to 2013. i.e., out of the total 45355 literature published 38181 are from multiple authors which 84.18 percent is of total output and 7174 papers are published by single author which is 15.8 percent of total output.

It could be seen clearly from the above discussion that the degree of collaboration in producing research output on Management Information System research has shown in Increasing trend during the study period; because the researcher has identified the selection area of Management Information System is a new discipline. Based on this study, the result of the degree of collaboration **C = 0.84**. i.e. 84 percent of collaborative authors' articles published during the study periods.

The table 6 reveals that the top ten prolific journals of MIS research output during the sample time span. the journal of "Expert Systems with Applications" has produced 380 records, TLCS 302 & TGCS 3926 and being the first rank position, followed by the journal of "Information & Management" has produced highest number of articles and stood in second place as per the above table. The journal of "MIS Quarterly" has earned the highest TLCS, TGCS and TLCR and stood in the first position based these values.

8. CONCLUSION

This paper has discussed the contributions made by Management Information System researchers during 1989 - 2013 as reflected in Web of Science Database. During the twenty five years time span publication is significantly increased. The collaborative work has been recognized compare to individual contribution, particularly two authors team has produced highest number of articles in MIS research. The individual scientist may be stimulated to distribute more number of contributions as an alternative of single contributions. the active authors is "Huang GH" from China. The most productive journal is " Expert Systems With Applications".

Table 5 Degree of Collaboration in Management Information System Research Output

Year	Single Author		Multi Authors		Total	Degrees of Collaboration
	Articles	Percents	Articles	Percents		
1989	26	0.36	23	0.06	49	0.47
1990	54	0.75	75	0.20	129	0.58
1991	196	2.73	361	0.95	557	0.65
1992	235	3.28	449	1.18	684	0.66
1993	238	3.32	487	1.28	725	0.67
1994	281	3.92	654	1.71	935	0.70
1995	300	4.18	610	1.60	910	0.67
1996	280	3.90	698	1.83	978	0.71
1997	278	3.88	773	2.02	1051	0.74
1998	244	3.40	839	2.20	1083	0.77
1999	285	3.97	953	2.50	1238	0.77
2000	318	4.43	1064	2.79	1382	0.77
2001	290	4.04	1087	2.85	1377	0.79
2002	312	4.35	1246	3.26	1558	0.80
2003	350	4.88	1511	3.96	1861	0.81
2004	303	4.22	1695	4.44	1998	0.85
2005	299	4.17	1837	4.81	2136	0.86
2006	340	4.74	2059	5.39	2399	0.86
2007	354	4.93	2225	5.83	2579	0.86
2008	380	5.30	2518	6.59	2898	0.87
2009	372	5.19	2901	7.60	3273	0.89
2010	386	5.38	3053	8.00	3439	0.89
2011	410	5.72	3405	8.92	3815	0.89
2012	319	4.45	3681	9.64	4000	0.92
2013	324	4.52	3977	10.42	4301	0.92
	7174 (15.82)	100.00	38181	100.00	45355	84.18

Table 6 Prolific Journals (10) According to Highest Research Productivity

Sl.No.	Journal	Recs.	%	TLCS	TGCS	TLCR
1	Expert Systems With Applications	**380**	0.8	502	3926	820
2	Information & Management	342	0.8	2200	8123	1171
3	Decision Support Systems	289	0.6	947	4247	984
4	Industrial Management & Data Systems	274	0.6	782	2969	1057
5	International Journal of Production Research	255	0.6	460	2836	923
6	International Journal of Information Management	249	0.5	641	2566	851
7	International Journal of Medical Informatics	248	0.5	609	4086	583
8	**MIS QUARTERLY**	248	0.5	**5556**	**19623**	**1351**
9	Journal of The American Medical Informatics Association	237	0.5	675	5410	449
10	European Journal of Operational Research	231	0.5	937	6633	438

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Usage Pattern of Differently Abled Students in Higher Education Institutions in Trichy: A Study

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Abstract

The findings of a study of the experiences of disabled students in higher education in Trichy city are reported. Detailed information about policy and provision for disabled students was sought from selected higher education institutions and 5 in-depth case studies of students were carried out. It is argued that disabled students face obstacles to their participation in many areas such as the physical environment, access to information, entrance to higher education, etc., This article talks about the information need for differently abled persons and the purpose of visiting the higher education resource centers, Also describe the advantages of assistive technology and hurdles faced by them to adopt the assistive technology.

Keywords: *Assistive Technology, Differently Abled, Learning Disorder, Talking Book*

1. INTRODUCTION

The UN estimates that there are 500 million differently abled persons in the world today. This number is increasing every year due to factors such as wars and destruction, unhealthy living conditions. The news that 98.8 per cent of young disabled people are currently being excluded from higher education in India, After discovering that only 1.2 per cent of students with disabilities had access to higher education, the then Union HRD minister Mr Arjun Singh has called for a seminar to make efforts to improve the situation. This shows the dismal state of adherence to the 3 per cent reservation for disabled students, as mandated by the Persons with Disabilities Act 1995,". The differently-abled come in a variety of shapes, sizes, colours, sex, cultures. They are unable to do certain things in the same way as the main stream of society. They may require some form of adaption or alteration to assist them to overcome the effect of their disability.

2. ADAPTIVE FACILITY

Libraries worldwide have put many of these adaptive facilities in place from general ones such as crutches, elevators, ramps, Braille, hearing aids etc. to more specialized ones such as CUPID, Drexter etc.,

3. DIFFERENTLY ABLED

Disability is the consequence of an impairment that may be physical, cognitive, mental, sensory, emotional, developmental, or some combination of these. A disability may be present from birth, or occur during a person's lifetime. Disabilities are an umbrella term, covering impairments, activity limitations, and participation restrictions. Impairment is a problem in body function or structure; an activity limitation is a difficulty encountered by an individual in executing a task or action; while a *participation restriction* is a problem experienced by an individual in involvement in life situations. Thus, disability is a complex phenomenon, reflecting an interaction between features of a person's body and features of the society in which he or she lives

The Constitution of India ensures equality, freedom, justice and dignity of all individuals and implicitly mandates an inclusive society for all including the persons with disabilities. As per the provisions of the Persons with Disabilities Act, 1995, seven categories of disabilities have been identified viz.,

i. Blindness
ii. Low vision
iii. Hearing impairment
iv. Locomotors disability
v. Learning disability
vi. Mental retardation
vii. Mental illness.

In general it can be broadly classified as

3.1 Physical Disability / Locomotor (mobility)

Any impairment which limits the physical function of limbs, fine bones, or gross motor ability is a physical impairment, not necessarily a physical disability. The

social model of disability defines physical disability as manifest when impairment meets a non-universal design or program

3.2 Hearing and Speech

Sensory disability is impairment of one of the senses. The term is used primarily to refer to vision and hearing impairment, but other senses can be impaired. Hearing impairment or hard of hearing or deafness refers to conditions in which individuals are fully or partially unable to detect or perceive at least some frequencies of sound which can typically be heard by most people. Mild hearing loss may sometimes not be considered a disability.

3.3 Visual Impairment

Vision impairment (or "visual impairment") is vision loss of a person to such a degree as to qualify as an additional support need through a significant limitation of visual capability resulting from either disease, trauma, or congenital or degenerative conditions that cannot be corrected by conventional means, such as refractive correction, medication, or surgery

3.4 Learning (disorder)

Intellectual disability is a broad concept that ranges from mental retardation to cognitive deficits too mild or too specific (as in specific learning disability) to qualify as mental retardation. Intellectual disabilities may appear at any age. Mental retardation is a subtype of intellectual disability, and the term *intellectual disability* is now preferred by many advocates in most English-speaking countries.

4. SERVICES RENDERED BY THE LIBRARIES TO THE DIFFERENTLY ABLED

4.1 Physical Disability

For the Physically challenged, services available are

i. Retrieving materials
ii. Photocopying
iii. Circulation/access assistance
iv. Reference
v. Research assistance
vi. Services at branch libraries
vii. Interlibrary loan
viii. Instruction
ix. Proxy allowed
x. Flyers or information sheets

4.2 Hearing and Speech

For the Hearing and Speech challenged, services available are

i. All library facilities should be made available
ii. Sign language programmes
iii. Pictures & Diagrams
iv. Visual Signaling Devices
v. Visual Redundancy for Computers

4.3 Visual Impairment

For the visually challenged, services available are

i. In large print
ii. Braille
iii. Audio formats
iv. Recorded books and talking books.

The assistive technology employed includes the JAWS (Job Access with Speech) voice synthesizer, Magic Professional Screen Magnifier for those with low vision, the Braille Embosser, which translates text to Braille and printed material, and the Poet OCR reading machine for reading documents to the visually challenged. These services are available in Children's, Adult and Heritage libraries.

4.4 Learning Disorder

For the intellectually challenged, services available are

i. In large print
ii. CCTV Reader
iii. Speaking Scanner
iv. Optical Character Recognition System (OCR)

5. SCOPE OF THE STUDY

A study has been covered differently abled students studying in Selected Arts and Science Colleges in Trichy which includes Bishop Heber College, St. Joseph College, National College, Jamal Mohammad College, Periyar E.V.R College to know how they seek information for their need.

5.1 Statement of the Problem:

The problem of the study is **Information Use Pattern Of Differently abled Students in Selected Arts and Science Autonomous Colleges in Trichy : A Study**

6. OBJECTIVES OF THE STUDY

i. To identify the information needs of differently abled students.
ii. To identify the purpose of visit to the library by differently abled students.
iii. To study the facility available for differently abled students.
iv. To study the service rendered for differently abled students.
v. To find the advantages of Assistive Technology
vi. To find the problems faced by students in using library facilities and services.

The Differently abled students study the information online and resources are one kind of computer network which is widely known. It is a global network and the most revolutionary development in the field of Arts and Sciences. Online resources are very useful to provide student services. Separate rooms are available for disable students.

7. PURPOSE OF THE STUDY

This study is to identify the information use by differently abled students from books, journals, e-resources and student support service cell.

8. HYPOTHESIS

Male differently abled students are using library more for the collection of information than female students. There is a significant relevance in terms of occupation of the parents and internet usage of differently abled students.

9. METHODOLOGY

This study is mainly based on the primary data collected from the learning community through well-designed schedule, besides the secondary data collected from text books, reference books, journal and internet.

9.1 Sampling

This study was taken to analyze the Information use pattern of differently abled students in selected Arts and Science colleges in Trichy. The questionnaires were distributed to 130 respondents, to measure the information seeking behavior of disabled students. Out of which 110 respondents were responded to the study. While selecting the sample utmost care was taken. We were adapting stratified random sampling technique by giving equal weight age to discipline, types of disabilities and information sources and the library services.

9.2 Data Collection

The Data were collected from Bishop Heber College, St. Joseph College, National College, Jamal Mohammad College and Periyar E.V.R College. The study is under taken among differently abled students of the above said colleges. All the questions were followed by alternative answers.

9.3 Statistical Tools adopted for the Study

Simple percentage and chi-square test is used.

9.4 Limitation of the Study

The present study on Information Use Pattern of Differently abled Students in Selected Arts and Science Autonomous Colleges in Trichy had come out 21 with variety of outcomes. However it has some limitations in its approach and upshot. The first and the foremost shortcoming is the convenient sampling, so that the result will be not properly generalized. It had concentrated only on differently abled Students of Under Graduate, Post Graduate and M. Phil Scholars.

10. ANALYSIS AND FINDINGS

In this chapter the collected data are analyzed and interpreted. The data are collected through questionnaire method. After checking the questionnaire for completion, the researcher analyzed the data. To have effective educational pattern, the need of differently abled students only considered.

In this chapter the research has analyzed and incorporated the data collected based on the differently abled sound objectives framed for the study. The data collected through questionnaire for completion, the researcher has analyzed the data. Nearly 21 tables were prepared and interpreted. Graphs, diagrams were also prepared to support the analysis part by using statistical methods.

Table 1 shows that the gender wise distribution of respondents, In which 56.36 % are male and 43.64 % are female.

Table 1 Gender-wise Distribution of the Respondents

Sl.No	Gender	Total No. of Respondents	Percentage
1	Male	62	56.36
2	Female	48	43.64
	Total	110	100.00

The above table 2 shows the age wise analysis of the respondents which indicate that 50% of them belongs to below 20 years, 31.81% respondents are belonged to 21–25 age group and remaining 18.19% belongs to above 25 age group. Thus the study reveals that half of the respondents of the present study are above 20 years of age.

Table 2 Distribution of Respondents by Age

Sl.No.	Gender	Total No. of Respondents	Percentage
1	Below 20 years	55	50
2	21 – 25 years	35	31.81
3	Above 25 years	20	18.19
	Total	110	100.00

Table 3, shows that the discipline of study. In which 63.63% of the respondents are arts students followed by Science students 29.09% and remaining 7.27% belongs to Management stream.

Table 3 Distribution of Respondents based on Discipline of Study

Sl.No.	Discipline	Total No. of Respondents	Percentage
1	Arts	70	63.63
2	Science	32	29.09
3	Management	8	07.27
	Total	110	100.00

Table 4, shows that the background of parents. Among the parents, 34.54% are daily wages, 26.36% are Farmers, 16.36% are private employees, 11.82% of respondents are Government employees and 10.92% of the respondents are business man.

This study revealed that majority of respondents belongs to Daily wages.

Table 4 Distribution of Respondents based on Background of Parents

Sl.No	Bcakground of Parents	Total No. of Respondents	Percentage
1	Farmer	29	26.36
2	Dailywages	38	34.54
3	Business	12	10.92
4	Government Employee	13	11.82
5	Private Employee	18	16.36
	Total	110	100.00

It is revealed from Table 5, that 29.09 % of the respondents belong to Bishop Heber College, 25.45 % and 10.90 % of the respondents belong to St. Joseph's College and National College. 11.84 % and 16.36 % are from Jamal Mohamed College and Periyar E.V.R. College respectively.

This study indicated that majority of the respondents are belongs to Bishop Heber College.

Table 5 Distribution of Respondents based on Name of the College

Sl.No.	Name of the College	Total No. of Respondents	Percentage
1	Bishop Heber College	32	29.09
2	St. Joseph College	28	25.45
3	National College	19	10.90
4	Jamal Mohammad College	17	11.84
5	Periyar E.V.R College	14	16.36
	Total	110	100.00

It is evident from the Table 6, that among the total respondent 41.82% are visually disabled students amd 20.90% are having Loco motor (Mobility) difficulty and the remaining respondents are 16.36% belongs to Accident category.

It is revealed that the majority of the responds are visually challenged students.

Table 6 Distribution of Respondents by Types of Disabilities

Sl.No.	Types of Disabilities	Total No. of Respondents	Percentage
1	Loco motor (Mobility)	23	20.90
2	Hearing and speech	14	12.73
3	Visual	46	41.82
4	Learning (intellectual)	9	08.18
5	Accident	18	16.36
	Total	110	100.00

Table 7, shows that 6.37 % of the respondents are collecting information from library. 50.91 % are from internet and 20.91 % are through coaching classes, whereas 21.81 % have their own book materials. Thus, more than half of the respondents are collecting information from Internet.

Table 7 Distribution of Respondents based on Collection of Information

Sl.No.	Collection of Information	Total No. of Respondents	Percentage
1	Library	7	06.37
2	Internet	56	50.91
3	Coaching Class	23	20.91
4	Own Book Material	24	21.81
	Total	110	100.00

Table 8, shows that the user frequency of library visit. 26.36 % are visiting the Library every day and 31.91 % once in a week. 19.91 % twice in a week and 41.82 % twice in a month. Thus, nearly half of the respondents go twice in a month.

Table 8 Distribution of Respondents by Frequency of Library Visit

Sl.No.	Frequency of Library Visit	Total No. of Respondents	Percentage
1	Every day	29	26.36
2	Once in a week	13	31.91
3	Twice in a week	12	19.91
4	Twice in a month	46	41.82
	Total	110	100.00

Table 9 shows the percentage of respondent's purpose of visit to the library. 90.90 % visit for reading newspaper whereas 20.91 % and 21.89 % for reading magazine and journals. 73.64 % and 54.54 % for reading textbook and for preparing notes.

It is inferred from the Table 10, that 71.18% of respondents are having access to Earphone facilities, whereas 66.36% of respondents have magnifier (Lens) and 25.45 access to ramp.

It is noted from the Table 11, 21.81% need the assistive technology whereas 78.19% do not require them.

Table 9 Distribution of the Respondents based on Purpose of Visit to the Library

Sources	Total No. of Respondents		Total Percentage
	YES	NO	
Reading Newspaper	100 (90.90)	10 (09.10)	100.00
Magazine	23 (20.91)	87 (79.09)	100.00
Journals	24 (21.89)	86 (78.18)	100.00
Reading Text Book	81 (73.64)	29 (26.36)	100.00
Preparing Notes for the Examination	60 (54.54)	50 (45.45)	100.00
Previous Year Question Papers	75 (86.18)	35 (31.82)	100.00
Class Assignments /Seminars	28 (25.45)	82 (74.54)	100.00
Preparation for Competitive Examinations	12 (10.91)	98 (89.09)	100.00
Knowledge and up to date Information	31 (28.18)	79 (71.82)	100.00

Table 10 Distribution of Respondents based on Analysis on Facility

Facilities	Total No. of Respondents		Total Percentage
	YES	NO	
Ramp	28 (25.45)	82 (74.55)	100.00
Magnifier (Lens)	73 (66.36)	37 (33.64)	100.00
Lift	68 (61.81)	42 (38.19)	100.00
Ear phone	79 (71.18)	31 (28.82)	100.00

Table 11 Distribution of Respondents by needing Assistive Technology

Sl.No.	Library User	Total No. of Respondents	Percentage
1	Yes	24	21.81
2	No	86	78.19
	Total	110	100.00

The above table-12, shows that the library services preferred by the respondents. 55.45% prefer audio player service and 28.18% assistive technology. 11.81% and 34.54% seek mobile service and photocopying service respectively. 13.63% and 14.54% seek printing and lending service respectively. 30% and 70% prefer ILL and reference. 84.54% and 17.27% go for OPAC and talking books. 32.72% each go for mail and online news. 2.72% go for voice synthesizer.

Table 12 Distribution of Respondents based on Library Services

Description	Total No. of Respondents		Total Percentage
	YES	NO	
Audio players	61 (55.45)	49 (44.55)	100.00
Assistive Technology	31 (28.18)	79 (71.82)	100.00
Mobile service	13 (11.81)	97 (88.19)	100.00
Photocopying	38 (34.54)	72 (65.46)	100.00
Printing	15 (13.63)	95 (86.37)	100.00
Lending and Retrieval	16 (14.54)	94 (85.46)	100.00
Inter library loan	33 (30.00)	88 (70.00)	100.00
Reference	78 (70.90)	32 (29.09)	100.00
OPAC	93 (84.54)	17 (15.46)	100.00
Talking books	19 (17.27)	91 (82.73)	100.00
Special e-mail id for disabled users	36 (32.72)	74 (67.28)	100.00
Online news providing	36 (32.72)	74 (67.28)	100.00
Voice Synthesizer	3 (02.72)	107 (97.28)	100.00

The above table 13, shows that for what purpose they surf internet. 9.09% and 6.36% use for academic purpose and career respectively. 16.36% and 25.45% communication and download information respectively where as 7.27% for recreation, and 35.46% for entertainment purpose only.

Table 13 Distribution of Respondents based on Internet Usage

Internet	Total No. of Respondents	Total Percentage
Academic purpose	10	09.09
Career	7	06.36
Communication	18	16.36
Upload and Download Information	28	25.45
Recreation	8	07.27
Entertainment	39	35.46
Total	**110**	**100.00**

The calculated value 19 is more than the table value 7.815 at 3 df at 0.05 level of significance. Hence the research hypothesis is rejected.

Table 14 Hypothesis 1: Male Differently abled Students are Using Library more for the Collection of Information than Female Students

Category	Total No. of Respondents		Inferences
	Male	Female	
Library	4	3	$\chi^2 = 19$ df = 3 P < 0.05 No significant
Own Book Material	14	10	
Coaching Class	4	19	
Internet	40	16	

The calculated value 20 is more than the table value 32.55 at 20 df at 0.05 level of significance. Hence the research hypothesis is rejected.

Table 15 Hypothesis 2: There is a Significant Relevance in Terms of Occupation of the Parents and Internet Usage of Differently Abled Students

Occupation	Academic Purpose	Career	Communication	Upload and download information	Recreation	Entertainment	Inference
Farmer	3	1	5	11	1	8	$X^2 = 32.55$ df = 20 P < 0.05 No significant
Daily wages	2	1	1	12	2	20	
Business	2	2	5	1	1	1	
Govt. Employee	1	1	2	2	2	5	
Private Employee	2	2	5	2	2	5	

The calculated value 20 is more than the table value 32.55 at 20 df at 0.05 level of significance. Hence the research hypothesis is rejected.

11. FINDINGS RELATED TO SOCIO DEMOGRAPHIC FACTORS:

In this chapter an attempt has been made to present the salient findings of the study based on the objectives. Suitable suggestions are also given from the findings.

i. 56.36% of the respondents are male in the present study.
ii. 64% of the respondents are from arts stream.
iii. Majority (50%) of the respondents are from the age group below 20 years.
iv. The respondents said that reading was their regular habit. Besides second choice goes to browsing internet for education and recreational purpose.
v. The study indicated that among the respondents those female respondents were not given permission by their parents to go out than male students.
vi. Among the respondents 55% of wheel chair bound students preferred News Paper & magazine reading.

vii. The wheel chair bound students indicated that their information needs were not fully satisfied.
viii. The study noted 34.54% of the respondents parents are daily wages.
ix. It is found that majority 30% of the respondents are from bishop Heber college.
x. It is found that majority 21% of the respondents are students from locomotors disability.
xi. Among the user 62% of the respondents nature of disabilities caused by birth.

12. SUGGESTIONS

i. It is suggested that the physical access to library should be improved.
ii. An effective user education progamme should be arranged regularly for the wheel chair bound students.
iii. Library promotions should also target parents &guardians as they are the one on whom the students rely to travel out of their homes.
iv. A specially designed National information network should be established to help the disabled persons.
v. The specific room alerting in our library to help the differently abled persons.

13. CONCLUSION

The present study was undertaken to assess the material available in well-established colleges in Tiruchirappalli City for differently abled students. It is revealed that most of the College libraries are yet to be equipped the special section which is meant for differently abled students and also adequate training should be given for efficient use of Assistive Technology.

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Knowledge Management - Concepts and Approach

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Abstract

This paper deals with the changing scenario of libraries, gives an introduction to knowledge management, the various concepts used in knowledge management, need for knowledge management, kinds of knowledge, knowledge management process, challenges for implementing knowledge management process in libraries and the skills required to be competent knowledge managers.

***Keywords**: Knowledge,Knowledge access, Knowledge environment, Knowledge management, Knowledge management process.*

1. INTRODUCTION

Nowadays, library and information science schools don't just teach librarians about cataloging and acquisitions, but also about how to build information systems (i.e., databases) and what the relationships are between users and these systems. The boundaries and scope of the profession has always been changing, but that change has accelerated recently, partly due to the rise in interest surrounding knowledge management.

It can be clearly seen that the environment in which academic libraries operate is changing. It is both faced with challenges and opportunities. Academic libraries need to respond to these challenges in order to better serve the needs of the entire academic community. One way of doing that is engaging in knowledge management activities, that is, creating, capturing, sharing and utilizing knowledge to achieve the library goals. Knowledge management is a viable means in which academic libraries could improve their services and become more responsive to the needs of users in the university. People gain knowledge from their experiences and their peers' expertise. Academic libraries need to recognise the knowledge its staff and create an environment in which their knowledge can be valued and shared.

3. WHAT IS KNOWLEDGE MANAGEMENT ?

"…a discipline that promotes an integrated and collaborative approach to the process of information asset creation, capture, organization, access, and use. Information assets include databases, documents, and, most importantly, the uncaptured expertise and experience resident in individual workers."

2. CHARACTERISTICS OF TACIT AND EXPLICIT KNOWLEDGE

Implicit or tacit knowledge	Explicit knowledge
Subconscious	Formally articulated
Perceived	Elucidated
Unaware	Aware
Difficult to articulate or unspoken	Fixed
Experienced based	Codified
Transferred through conversation	Documented (written, taped, recorded, digitized, etc.)
Embedded in stories and narratives	Stored in repositories (databases, files, etc.)
Escapes observation	Can be viewed or heard
Held within self	Shared with others
Personal	Organizational
Insights and understandings	Pushed or pulled
Judgments	Reports, lessons learned
Assumptions	

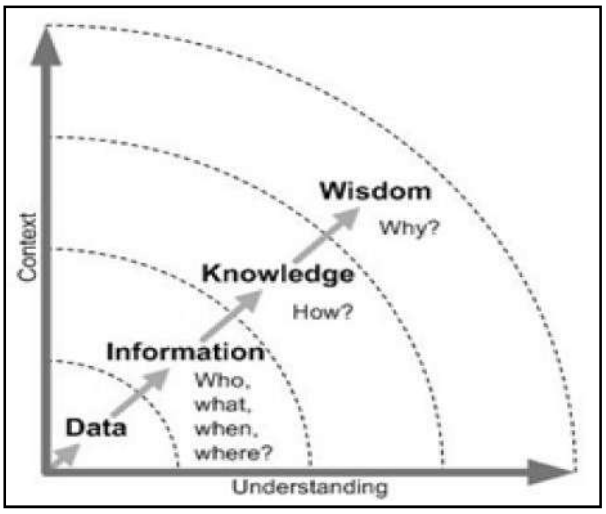
(The Gartner Group) "…a formal, directed process of figuring out what information a company has that could benefit others in the company, then devising ways of making it easily available." (Harvard Management Update)

KM best practices specify different types of knowledge. The types most often referenced are*tacit knowledge* and *explicit knowledge*.

Tacit knowledge represents internalized knowledge that an individual may not be consciously aware of, such as how he or she accomplishes particular tasks.

Explicit knowledge represents knowledge that the individual holds consciously in mental focus, in a form that's easily communicated to others.

In 2007, the IT Infrastructure Library v3 (ITIL v3) introduced a Knowledge Management process including definitions for data, information, knowledge, and wisdom.



Data is a set of discrete facts about events. It is unorganized and unprocessed facts .Data is a prerequisite for information. Data are collected from a study involving observations, experimentation or surveys. Such data are called raw data, raw data needs organizations and syntheses. The organized data is called systematized data

Information means shaping the data to arrive at a meaning in the eyes of the perceiver. Information is the aggregation of data that makes decision making easier. Information has meaning, purpose and relevance. Information comes from providing context to data.

Knowledge has been an essential component of all human progress, knowledge is the most cherished remedy for complexity and uncertainty. Knowledge includes perception, skills, training, common sense and experience. Knowledge is composed of the tacit experiences, ideas, insights, values and judgments of individuals as well as from the analysis of information and data.

And wisdom gives the ultimate discernment of the material and having the application and contextual awareness to provide a strong, common sense judgment. The Data-Information-Knowledge-Wisdom (DIKW) structure the above figure demonstrates phases of increased context and understanding and how data is transformed into information, then knowledge, and finally wisdom.

i. Information is visible, independent from action and decision, different in format after processing, physical product, independent from existing environment, easily transferable, and duplicable.
ii. Knowledge is invisible, closely related to action and decision, different in thought after processing, spiritual product, identified with existing environment, transferable through learning, and not duplicable.

3.1 Kinds of Knowledge

i. That type of knowledge which deals with reasoning, strategies and decision making methods, is called **Methodological Knowledge**.
ii. That type of knowledge which deals with hypothesis, judgments and expectations held by knower's, is called **Expectational Knowledge.**
iii. That type of knowledge which deals with systems, concepts and perspectives, is called **Conceptual Knowledge**
vi. That type of knowledge which deals with data and measurements, and directly observable and verifiable, is called **Factual Knowledge.**
v. That type of knowledge which is explicit and can be learned and shared is **public knowledge**
vi That type of knowledge usually inside the persons mind and is least accessible is **personal knowledge**

4. WHY IS KM IMPORTANT TODAY?

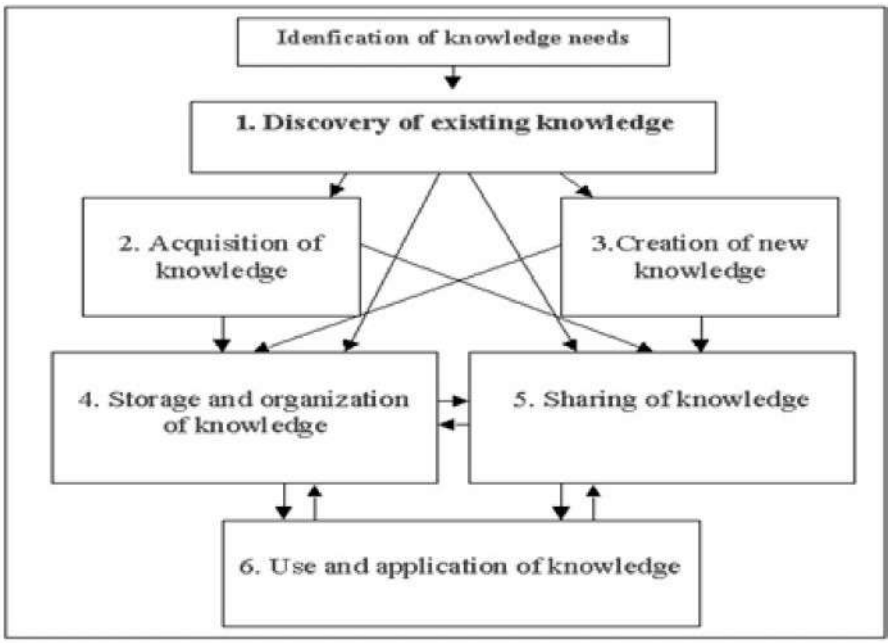
i. Globalization of business.

ii. Leaner organizations. We are doing more and we are doing it faster, but we also need to work smarter as knowledge workers, adopting an increased pace and workload.
iii. "Corporate amnesia." We are more mobile as a workforce, which creates problems of knowledge continuity for the organization and places continuous learning demands on the knowledge worker. We no longer expect to spend our entire work life with the same organization.
iv. Technological advances.

4.1 Features of Knowledge Management Processes

i. Measuring the value of knowledge assets and/or impact of knowledge management.
ii. Transferring existing knowledge into other parts of the organization.
iii. Facilitating knowledge growth through culture and incentives.
iv. Representing knowledge in documents, databases, and software.
v. Embedding knowledge in processes, products, and/or services.
vi. Using accessible knowledge in decision making.
vii. Accessing valuable knowledge from outside sources.
viii. Generating new knowledge.

Knowledge Management Process



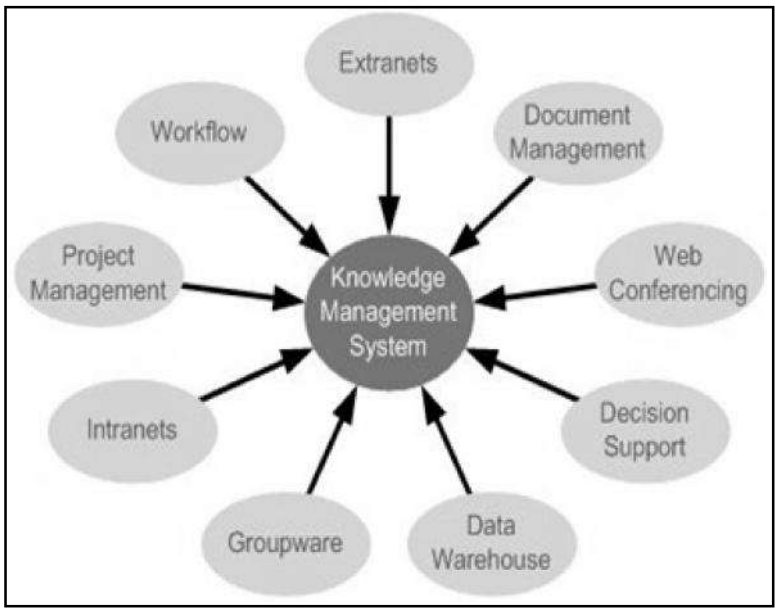
i. Knowledge creation
ii. Knowledge acquisition
iii. Knowledge capture
iv. Knowledge sharing
v. Knowledge record
vi. Knowledge preservation

4.2 Create Knowledge Repositories

Librarians are familiar with knowledge repositories. In terms of library operational information, most integrated library systems contain a component intended to provide useful information about library operation and user activity. This kind of information can be used to create explicit organizational knowledge, to inform services, to guide operations, and to measure goal attainment. Data about new monographs, for example, are created routinely when these items are added to the collection. These data could be combined with circulation data and online reviews to create notices for distribution to prospective readers. Or, usage data from an electronic reserve service could be aggregated and sent to the instructor in time to modify class activities to take advantage of what has been used. In each of these cases, data that are collected routinely as part of the operation of the integrated library system can be used to create and share knowledge that contributes to the improvement of teaching and research. By creating knowledge from existing data, libraries add value to integrated library systems.

External knowledge repositories also can be used to achieve organizational objectives.

Improve Knowledge Access



Knowledge management project is one that improves access to and transfer of organizational knowledge. This often takes place by creating expert networks where individuals with desired expertise are organized formally into a network and put into contact with others, creating a community of interest. An example might be a network of subject specialists, perhaps from several institutions, who come together to share experiences and learn from each other. Another method is to create yellow pages, classifying individuals by different areas of expertise into a logical whole. Internal cross-training and exchange with other organizations also are used.

An effort to improve access to strategic knowledge, It is built upon six goals: (1) universal access (users have easy access); (2) collaborative environment (with users and tools); (3) transparency (fluid movement of knowledge and work); (4) integration (use of flexible interfaces to meet unique needs); (5) intelligent tools for leveraging knowledge; and (6) computing as a tool (modeling and simulation are integral to the service)

A virtual library can complement and reinforce existing library services and to encourage increased knowledge transfer. The virtual library emphasizes services that are proactive, such as selective dissemination of information and document delivery. In addition, research consultants combine tacit knowledge drawn from working directly on research teams with knowledge of the virtual library to identify and transfer useful research information directly to users. The result is more highly focused provision of appropriate scholarly information in formats and at times convenient to the users.

4.3 Enhance the Knowledge Environment

There are a number of KM best practices, all of which comprise similar activities. In general, these activities include knowledge strategy, creation, identification, classification, capture, validation, transfer, maintenance, archival, measurement, and reporting.

Enhancing the knowledge environment is the third type of knowledge management process. It focuses on creating an environment that encourages the creation and transfer of knowledge. If the tacit knowledge about users held by a reference librarian could be shared with systems personnel, for example, a more effective library home page would result. To create an environment supporting this kind of knowledge, management must generate meaningful contacts among the staff, provide resources and incentives, and praise progress. Both the library and the electronic publication program can benefit from this cooperative environment. The library gains additional information resources of high internal value, and the electronic program does not have to support the distribution of the information.

4.4 Manage Knowledge as an Asset

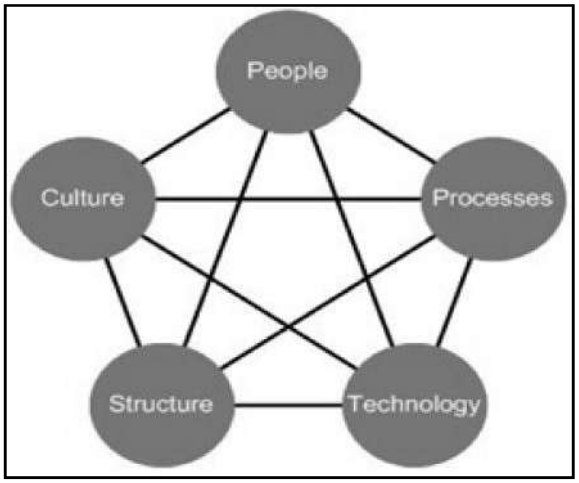
Managing knowledge as an asset is the the least familiar to librarians. Although some companies audit their intellectual resources internally each year, libraries tend to simply list their physical holdings and easily quantifiable activities, assuming that each item or activity measured is equally valuable and goal related. Some firms manage their intellectual capital to achieve maximum return, something most librarians have not considered. What would happen if librarians began to manage the library's assets explicitly to achieve maximum return? How would libraries value the operations knowledge in the heads of library workers? How should libraries value the knowledge embedded in their processes and products? How should they value the growing amount of information to which they have electronic access? It is no longer enough for library leaders to make intuitive decisions. To achieve quality, commitment, and acceptability, these decisions must be based on organizational knowledge and made collaboratively.

4.5 Knowledge Management Assessment

The KM assessment should cover all five core KM components: people, processes, technology, structure, and culture.

People represents how you increase the ability of individuals within the organization to influence others with their knowledge.

Processes involves how you establish best practices and governance for the efficient and accurate identification, management, and dissemination of knowledge.



Technology addresses how you choose, configure, and utilize tools and automation to enable KM.

Structure implies how you transform organizational structures to facilitate and encourage cross-discipline awareness and expertise.

And culture embodies how you establish and cultivate a knowledge-sharing, knowledge-driven culture. .

4.6 Challenges for implementing Knowledge Process Management

i. Inability to recognize or articulate knowledge;
ii. Turning tacit knowledge into explicit knowledge.
iii. Geographical distance and/or language barriers in an international company.
iv. Limitations of Information and Communication technologies.
v. Loosely defined areas of expertise.
vi. Internal conflicts - professional territoriality.
vii. Lack of incentives or performance management goals.
viii. Poor training or mentoring programs.
ix. Cultural barriers - this is how we've always done it.

4.7 Skills Transitions Librarians Need to Make to Be Effective in KM

It is important for academic libraries to encourage librarians to constantly update their skills and competencies in this changing environment

i. From being flexible to thinking laterally
ii. From being a team player to thinking about the organization globally, not just their professional function
iii. From creating, recording, and storing information effectively to thinking about how information is used and planning strategically
iv. From strong communication skills to effectively managing change
v. From assessing and evaluating information to creating systems to connect the right people to the right information
vi. IT literacy, that is knowing how to use the appropriate technology to capture,catalogue and disseminate information and knowledge to the target audience and knowing how to translate that knowledge into a central database for employees of the organisation to access;

vii. A sharp and analytical mind;
viii. Innovation and inquiring;
ix. Enables knowledge creation, flow and communication within the organization and between staff and public.
x. Building knowledge taxonomies (for organising knowledge resources on Websites and Portals)
xi. Understanding of information and knowledge needs of users
xii. Ability to map internal and external knowledge
xiii. Understanding of the library's information and knowledge flows

5. CONCLUSION

Academic librarians can benefit their institutions, their libraries, and themselves by undertaking a campuswide role in managing organizational knowledge. They can use knowledge management as a way to expand the library's role to areas such as administration or support services, where libraries have had little impact in the past. Moreover, they can develop cross-functional teams with units such as computing, instructional technology, institutional planning, and personnel to create collaborative organizations that have major institutional missions and responsibilities.

Higher education is in the midst of major change as accountability, technology, faculty aging, distance education, and many other pressures come to bear. Knowledge management offers an opportunity to manage some of these issues and achieve institutional goals by using organizational knowledge. Libraries can bring specific skills in the selection and organization of knowledge, training, and user support to cross-functional teams.

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Activities Related to Book Publications in Tamil Language in Tamil Nadu

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Abstract

The present paper attempts to analyze the problems faced by the book industry in the ICT Age and evaluates the contribution made by book publishers and analyses its impact on the public. The major book publishing activities like planning, printing, publishing, marketing and arranging for further promotion are studied. The book publishers are alert enough to adopt innovative techniques to meet the problems and challenges of today.

Keywords: BAPAS, Binding Materials, Book Fair, Luxury Editions, NCACR, Print Publications.

1. INTRODUCTION

The progress of human civilization has been facilitated by a number of epoch-making discoveries and inventions. They are taking place in a sequential order based on necessities and resulting in the enrichment of practical utilities. The word 'book' has been derived from the Anglo saxon word 'boc', which means the bark of trees. A book has been either a written document or a record, on a written or a printed literary composition. It can be a volume of accounts or notes. The book can also be published in printed or electronic form. The Dictionary of printing and publishing states that a book is a set of printed sheets of papers attached together in a cover. Book, in publishing is defined by the United Nations Educational Scientific and Cultural Organization (UNESCO) for statistical purpose as a non-periodical printed publication of atleast 49 pages excluding the covers. There is rarely any clear definition that satisfactorily covers all the variety of publications in use. Books are the precious legacies and boon to mankind to enrich and enhance their knowledge and experience.

A book is basically designed to serve as a mode of communication. Its unique feature is that it communicates silently not only between mind and mind but also between soul and soul. A good book closes hundreds of prisons and opens thousands of mind. Before ten years nearly 10,000 books were published in a year. Now approximately 10,000 books are published in a day. This shows the significance of books in the life of modern man in this ICT age.

2. OBJECTIVES OF THE STUDY

i. To highlight the nature and salient features of book publishing activities
ii. To analyse the development patterns of the book publishing industry in Tamil Nadu.
iii. To compute and interpret the trend and compound growth rates for key variables in Books in Tamil Language in Tamil Nadu.
iv. To evaluate the contribution made by book publishers and the opinions/views expressed by the cross section.
v. To examine the problems and hurdles faced by the book industry in Tamil Language in Tamil Nadu.

3. METHODOLOGY

This is an explorative and diagnostic research exercise on a vital, social and educational problem at the state level. It includes analyses, inferences and forecasts. Books published on reports, seminar papers, articles and media comments in Tamil Language are used in the analyses and interpretations. Opinions and views of concerned sections of the book world have been collected and inferences drawn.

4. SCOPE OF THE STUDY

This state level survey study has an investigative stress with an explorative goal. It covers the book publishing activities of Tamil Nadu area members of the Book Sellers' and Publishers' Association of South India (BAPASI) that forms a single majority in the state. The

major book publishing activities like planning, printing, publishing, marketing and arranging for further promotion are studied. Several types of books except those in Braille published by members of the Book Sellers' and Publishers' Association of South India (BAPAS) are taken for analysis.

5. REVIEW OF LIBERATURE

Books and libraries constitute key inputs in the expansion of literacy and knowledge. On the basis of this premise, a number of academic studies have been made and completed successfully. But research on book publishing has not received its due attention in south India. Modern researchers, government departments and authors evince great interest in studying the problems and prospects of the book publishing industry. Some of the previous studies serve well in understanding the research works already done in this aspect. They also point out the work yet to be done and the scope for further investigation. The present research work is a unique and pioneering one as far as its scope, the methodology adopted and the region taken are concerned.

M.N. Rao's manual on book publication, requirements of book publishing field, the levels of satisfaction, the inbuilt incentives and the open and hidden challenges relating to the publication work have been enumerated carefully. An honest effort to offer suitable solutions has been carried out by the author. A few case studies have been chosen for discussion. This work throws light on some of the comments and opinions commonly voiced on print publications. The National Council of Applied Economic Research (NCAER) conducted a comprehensive research work on the Indian publishing industry that covers the several facets of the book publishing industry in India. It's main facets were preparation of manuscripts.

6. ANALYSIS AND ITNERPRETATION

A careful analysis of the figures in the table reveals that there has been a steady trend of ascendancy over the years. In 2001, the first year of the study period, there were 210 publishers. It rose to 216 in 2002; 222 in 2003; 228 in 2004, 235 in 2005 and ultimately the number rose to 292 in the last year of the study period, that is 2013.

A careful analysis of the figures in the table reveals that there has been a steady trend of ascendancy over the years. In 2001, the first year of the study period, there were 210 publishers. It rose to 216 in 2002; 222 in 2003; 228 in 2004, 235 in 2005 and ultimately the number rose to 292 in the last year of the study period, that is 2013.

Table 1 Total Number of Book Publishers in Tamil Nadu

Year	Number of Publishers	Year	Number of Publishers
2001	210	2008	256
2002	216	2009	265
2003	222	2010	272
2004	228	2011	278
2005	235	2012	285
2006	241	2013	292
2007	249		

Source: Primary Data

From the figures relating to this category of Tamil Book publishers having own printing units and have got expanded over the years. There are two stages of non change in 2003 and 2004, as well as in 2006 and 2007. In 2008 there were 81 publishers with own press and it is raised to 105 in 2013.

Table 2 Number of Tamil Book Publishers in Tamil Nadu

Year	Number of Publishers	Year	Number of Publishers
2001	50	2008	81
2002	53	2009	85
2003	59	2010	90
2004	59	2011	94
2005	64	2012	98
2006	68	2013	105
2007	68	-	-

Source: Primary Data

Though the figures relating to this category of publishers having own printing units have got expanded over the years, there are two stages of no change in 2002 and 2003 as well as 2006 and 2007, similarly in 2008, there were 66 publishers with own press and it came raised to 90 in 2013. This statistical report on the raise of publishing houses in Tamil Nadu.

Table 3 Publishing Houses with Own Printing press

Year	Number	Year	Number
2001	36	2008	66
2002	41	2009	71
2003	41	2010	75
2004	49	2011	79
2005	53	2012	84
2006	57	2013	90
2007	57	-	-

Source: Primary Data

Out of 197, 29 of the publishers are in the field on a hereditary basis. From one generation to the next generation, the business has moved on and has been functioning, This type has the merit of an inbuilt expertise and good will of the publishers as well as the public. This analysis on the hereditary business on book publications at different age groups.

Table 4 Length of Business

Years	Number
BELOW 20 YEARS	73
21 - 40	36
41 -60	53
61 - 80	22
81 - 100	12
Above 100	01
	197

7. DELUXE BOOK EDITIONS

Some books are published as deluxe or luxury editions. Special care is taken in the choice of paper, ink and also binding materials. These volumes are made in a costly and, luxurious manner. These types of books are mostly purchased for giving gifts or sending to foreign countries or for library purposes. Though the deluxe or luxury volumes are very common in developed countries, they are not totally absent in developing countries like India. Tamil Nadu publishers have realized the importance of the deluxe editions to compete in the technologically developed business industry..

The study shows a steady upward trend in the publication of deluxe or luxury editionsas explained in the following table. In 2001, just 136 books were brought out in the deluxe form. With marginal ups and downs, it has touched 222 level in 2013. The necessary figures are presented, in the following table, for the study period.

Table 5 Deluxe Editions

Year	Number	Year	Number
2001	136	2008	188
2002	145	2009	195
2003	151	2010	205
2004	155	2011	211
2005	162	2012	217
2006	172	2013	222
2007	180	-	-

Source: Primary Data

In 2001, just 136 books were brought out in the deluxe form. With marginal ups and downs, it has touched 222 level in 2013. The necessary figures are presented, in the following table, for the study period.

8. BOOKS FOR COMPETITIVE EXAMINATIONS

These are days of the struggle for survival and in that struggle, the fittest alone can survive. To secure a descent job, one has to prove one's merit by securing creditable ranks in competitive and other evaluation examinations or tests. For such preparation, standard and updated books are essential.

In Tamil Nadu, a few publishers take special care and give due importance to the publication of books meant for competitive examination at different levels. A a majority of publishers in the Book Sellers' and Publishers' Association of South India (BAPASI) evince interest in selling such books. During the study period the same two publishers were found giving adequate importance to the production and sale of books meant for competitive examinations.

9. BOOK FAIRS AND EXHIBITIONS

Book fairs and exhibitions serve as an opportunity to face the challenge of todays competitive world. Book fairs provide opportunities to both the publishers and the sellers to meet the readers. It is a challenge to the publishers and sellers to satisfy the tall expectations of the well informed readers. Gradually they have been becoming popular and conducted annually in urban centers and particularly at places where educational institutions are located in good number.

In book fairs, the popular titles are made available for browsing and sale. A unique feature is the personal

meeting between the reader and the publisher. They can clarify doubts easily and collect information regarding books quickly. Readers often get attractive discounts on the prices of books. In Tamil Nadu almost all the members of the Booksellers' and Publishers' Association of South India (BAPASI) evince adequate interest in participating actively in book fairs and exhibitions. A difference in the participation of foreign publishers and Indian publishers is that the former exhibit or display their publications and collect orders and the latter do all the three functions showing titles, securing orders for them and selling books, on the spot.

These book fairs are conducted in such a manner to attract a large number of potential buyers by displaying new editions, making available reputed volumes and also by sponsoring interesting entertainment events and quiz programmes. Encouraging prizes are distributed to the lovers of books. Such exhibitions fulfill the need of elite readers as well as induce the ignorant readers to be aware of the new trends in the fast changing technological world. Hence the book fair plays a significant role in the field of publication by paving a way to know the public interest.

10. CONCLUSION

An attempt is made in this study to investigate the features, the structure and the pattern of development of book publishing activities in Tamil Nadu between 2001 to 2010. The members of Booksellers' and Publishers' Association of South India (BAPASI) constitute a single majority of publishers and sellers in the state. This industry consists of authors, printers publishers, sellers and readers. The book publication activities are complex but highly useful to the elite society. Adequate importance is given to highlight some of their problems and requirements. Potentials and prospects of the publishers are briefly analyzed.

From the analysis, it may be concluded that the development pattern of book publishing activities in Tamil Nadu during the study period has shown progressive growth rates and healthy trends including comparative comprehensiveness, rational response, balanced approach and functional fitness. Still, some amount of skepticism is expressed regarding the future of printed books in the light of swift changes with far reaching consequences influenced by information and technological revolution. A very careful analysis of the opinions and views expressed by experts strengthens the argument that the printed book cannot be substituted easily and it will continue to reign for another thousand years. In the world of literacy, the modes may change, but the abode is the same. Methods of reading may change, but reading material will have a flow with an originality. One can optimistically expect a computer to supplement a book but not substitute the same.

The book publishers are alert enough to adopt innovative techniques to meet the problems and challenges of today. Their spirit to venture and grow seems to be a strong source of rewarding performance. With admirable contributions, the publishers' journey is bound to be continuous and rewarding. A more conducive environment shall pave the way for the publication of better books and the achievement of greater success. The increment in the number of print publications in the coming years as in the past years is an evidence of developments and innovations of human mind which is becoming more and more enriched with new resources, trends and technology to suit the need of modern man.

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An Opinion on E-Infrastructures in Engineering Colleges Libraries by the LIS Professionals: A Study

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Abstract

This paper outlines the LIS professionals opinion on infrastructure in Engineering College Libraries in Kanchipuram and Thiruvallur District. Totally 300 numbers of questionnaires were distributed among the LIS professionals and 140 from Kanchipuram and 120 from Thiruvallur were responded. It is found from the study that the Online and Digital Resources- Collection Development Infrastructure is highly satisfied by the professionals and it is in the second position. and nearly 63 per cent of the professionals are satisfied infrastructures of web based tools.

Keywords: *E-Infrastructures, Engineering College Libraries, Satisfaction level.*

1. INTRODUCTION

Information is knowledge, facts or data, which can be used, transferred or communicated.It isthe result of research, experience and observation. It is regarded as a resource of resources. Itplays a key role in economic, social, educational and cultural realms of the society. It is veryimportant in transforming society speedily and it is a vital resource and input in the overalldevelopment and growth of a country. The supply of correct and reliable information at the righttime to the right person helps in minimizing wastage of resources and avoids duplication ofwork. Information plays a vital role in the growth of knowledge and wisdom, research andinnovation, development and design, production and marketing, decision making andmanagement, and education and training.

The users of engineering college libraries are students, research scholars and faculty members.They require information for learning, research and teaching purposes. The engineering college libraries contain various kinds of information resources and they provide various informationservices and facilities to meet the information needs of their user community. A study oninformation sources, services and facilities of engineering college libraries based on theperceptions of faculty members help the library authorities in the better organization andrestructuring of their resources to meet the information requirements of users.

2. E-RESOURCES

The knowledge of the technologies of information and communication is especially important because it refers to an area of the knowledge generated by men and that has been produced to make viable exchange forms and relations; they are fundamental support of the process of the current globalization that leads to the knowledge society. The electronic media has provided many possibilities and opportunities for providing faster and quicker access to information at the global level. The technology for electronic publishing, electronic storage, processing and delivery of information including text and images. Electro environment facilitate enhancement in the speed of service, number of users served, the quantum and exhaustiveness of information provided.

Electronic information otherwise called as digital information, in the new era is changing the duties and services in all fields from traditional to digital form. The information is a dynamic and unending resource that affects all disciplines and all walks of life. It supports education, research and development. Electronic information otherwise called as digital information, in the new era is changing the duties and services in all fields from traditional to digital form. The information is a dynamic and unending resource that affects all disciplines and all walks of life. It supports education, research and development.

3. REVIEW OF LITERATURE

Haneefa K(2007)[1]found that a good number of the users were not satisfied with the present application of ICT in their libraries and indicated that 'inadequate ICT infrastructure' as their reason for dissatisfaction. Large majority of the users agreed that there was a need for workshops/orientation programs on the use of ICT based resources and services. Sharma et. al. (2009)[2]described that ICT in research libraries of Haryana all the libraries are well strengthen in ICT and are able to meet the requirements faced. NITK library expensed more on various resources rather than NDRI and NBAGR. The study showed that the trends of libraries have been diversified: these are giving more significance to various aspect of ICT such as internet, e-mail, online databases, online journals, e-books, e-thesis, online FAQ etc. In the ICT race coming time will not give a pause and it is an unavoidable tool in all kind of libraries to survive in the future. Dhanavandan (2008)[3]indicates that all respondents use some kind of ICT tools, particularly the Internet and mobile phones. The use of ICT by the female respondents is somewhat higher than that of male respondents. There is no significant relationship between the use of e-mail and Internet and gender nor between age (below or above 40) and the use of ICT, although there is some variation. Respondents strongly believe that ICT tools play a significant role in supporting and enhancing their professional and research activities. Their comments also suggest that they see the use of ICT as potentially going well beyond the use of the Internet to search for resources and the use of e-mail to stay in touch with friends, colleagues, and experts. Dhanavandan (2011)[4]found that the role of engineering colleges in the technical manpower development is quite significant. They need rapid Information Communication Technology infrastructure and in this context, there is a need for adequate development of electronic resources. The lack of adequate finance is the main reason for not developing information communication technology infrastructure especially in the case of libraries, those that do not receive financial aid from UGC of India or others like AICTE. The problem can be solved only through the aid from the state government or AICTE. The establishment of information communication technology infrastructure facilities in the self-financing college libraries in Tamil Nadu can improve the efficiency of information support, the information retrieval andquality of education as a whole. Dhanavandan and Tamizhchelvan (2012)[5] affirmed that "the users are acquiring knowledge from E-Books, E-Journals, Online resources, CD-ROMs, and Internet with related Databases".

4. OBJECTIVES OF THE STUDY

i. To identify Status of E-Infrastructure in Libraries
ii. To examine Professionals of their Satisfaction of E-Infrastructures
iii. To Satisfaction Level of Library types of Infrastructures
iv. To identify Problems faced while providing E-Infrastructures services

5. METHODOLOGY

In this study survey method, interview and observation methods are used for collection of primary data. Questionnaire is used for collection of data. There are126 Engineering colleges in Thiruvallur and kanchipuram districts in Tamil Nadu. Out of them, 300 professionals were selected as sample by startified random method. The investigator personally distributed the questionnaire to the LIS professionals. Out of 300, 140 from Kanchipuram district and 120 from Thiruvallur district were responded.

6. ANALYSIS OF DATA AND DISCUSSION OF RESULTS

The collected data has been analyzed and interpreted as per the objectives stated above. Distribution of questionnaires among the library professionals working in Engineering Colleges are shown table 1.

Table 1 shows the distribution of questionnaires among the library and Information science professionals in the Engineering Colleges in Kanchipuram and Thiruvallur districts. It is evident from Table 1,150 numbers of questionnaires equally distributed to Kanchipuram and Thiruvallur districts among the LIS professionals. Out of 300, 140 from Kanchipuram and 120 from Thiruvallur were responded.

Table 1 Distributions of Questionnaires among LIS Professionals

Sl. No.	Districts	Distributed	Percentage	Received	Percentage
1	Kanchipuram	150	50.00	140	46.67
2	Thiruvallur	150	50.00	120	40.00
	Total	300	100.00	260	86.67

Table 2 shows the status of E-Infrastructures available in their respective libraries by the respondents. Out 260, 212(81.53%) professionals are opined available and 48(18.47%) are replied not available the E-Journals. But in the case availability of E-Projects, 208(80.00%) professionals are agreed and 52(20.00%) are not agreed. It is concluded from the table, nearly 13 percentage of the professionals are replied and the video lectures is not available in their library.

Table 2 Status of E-Infrastructure in Libraries

Sl. No.	Services	Replies			
		Yes	Percentage	No	Percentage
1	E-Journals	212	81.53	48	18.47
2	E-Periodicals	191	73.46	69	26.54
3	E-News Paper	148	56.92	112	43.08
4	E-Projects	208	80	52	20.00
5	E-Books	172	66.15	88	33.85
6	CD & DVDs	98	37.69	162	62.30
7	DELNET	215	82.70	45	17.30
8	IEEE Collections	172	66.15	88	33.85
9	Video Lectures	225	86.53	35	13.47

It is clear from Table 3 that the majority of professionals are opinioned that the E-Journals resources, DELNET and IEEE collection were highly satisfied. Further, CD & DVDs, Video Lectures and Project Reports were satisfied. It evident from the table, Majority of the library professionals was satisfied regarding the collection of E-Infrastructures available in their libraries.

Table 3 Distribution of Professionals of their Satisfaction of E-Infrastructures

Sl. No.	Reference Sources	Highly Dissatisfied	Dissatisfied	No Opinion	Satisfied	Highly Satisfied	WAM	Rank
1	E-Journals	61 (23.46)	19 (7.30)	24 (9.23)	62 (23.84)	94 (36.15)	4.008	1
2	E-Periodicals	24 (9.23)	32 (12.30)	16 (6.15)	102 (39.23)	86 (33.07)	3.746	5
3	E-News Paper	54 (20.76)	19 (7.30)	23 (8.84)	73 (28.07)	91 (35.00)	3.492	7
4	E-Projects	34 (13.07)	37 (14.23)	28 (10.76)	57 (21.92)	104 (40.00)	3.615	6
5	E-Books	18 (6.92)	14 (5.38)	13 (5.00)	118 (45.38)	97 (37.30)	3.419	8
6	CD & DVDs	29 (11.15)	24 (9.23)	13 (5.00)	85 (32.69)	109 (41.92)	3.850	4
7	DELNET	19 (7.30)	13 (5.00)	26 (10.00)	97 (37.30)	105 (40.38)	3.985	2
8	IEEE Collections	23 (8.84)	21 (8.07)	15 (5.76)	88 (33.84)	113 (43.46)	3.950	3
9	Video Lectures	46 (17.69)	41 (15.76)	23 (8.84)	98 (37.69)	52 (20.00)	3.265	9

Table 4 represented the various type's infrastructures available in the engineering college libraries. The Library infrastructures were categorized under five heading such as Books and Journals -Collection Development Infrastructure, Online and Digital Resources- Collection Development Infrastructure, Software Infrastructure, Hardware infrastructure and Web based tools infrastructures. The majority of the respondents are highly satisfied to the Books and Journals -Collection Development Infrastructure and it is in the first rank. Followed by the Online and Digital Resources- Collection Development Infrastructure is also highly satisfied by the professionals and it is in the second position. It is concluding from the table, nearly 63 per cent of the professionals are satisfied infrastructures of web based tools.

Table 4 Satisfaction Level of Library Types of Infrastructures

Sl. No.	Infrastructures	Highly Dissatisfied	Dissatisfied	No Opinion	Satisfied	Highly Satisfied	WAM	Rank
1	Online and Digital Resources- Collection Development Infrastructure	23 (8.85)	30 (11.54)	18 (6.92)	103(39.62)	86 (33.08)	3.765	2
2	Books and Journals - Collection Development Infrastructure	25 (9.62)	29 (11.15)	12 (4.62)	85 (32.69)	109 (41.92)	3.862	1
3	Hardware Infrastructure	15 (5.77)	53 (20.38)	15 (5.77)	98 (37.69)	79 (30.38)	3.666	3
4	Software Infrastructure	31 (11.92)	39 (15.00)	32 (12.31)	54 (20.77)	104 40.00)	3.619	4
5	Web Based tool Infrastructure	51 (19.62)	24 (9.23)	21 (8.08)	71 (27.31)	93 (35.77)	3.504	5

Table 5 represented the Problems faced while providing E-Infrastructures services in the engineering colleges by the library professionals. Based WAM analysis the most of the professional were given first place to the problem faced in library for the low configuration of computer systems inside the library.

The majority of the professionals were suggested their service point of view few information sources are very expensive. It is concluding from the table, nearly 77 per cent of the professionals were faced by the language and technological barriers is major problems.

Table 5 Problems Faced While Providing E-Infrastructures Services

Sl. No.	Problems	Always	Often	Sometimes	Rarely	Never	WAM	Rank
1	Too Many Professional Work and Commitments	21 (8.08)	20 (7.69)	38 (14.62)	75 (28.85)	106 (40.77)	3.865	9
2	Latest Information Sources Are Not Available	15 (5.77)	24 (9.23)	42 (16.15)	86 (33.08)	93 (35.77)	3.838	10
3	Lack of Support from Authorities	28 (10.77)	22 (8.46)	12 (4.62)	81 (31.15)	117 (45.00)	3.912	6
4	Needed Information is not Available	27 (10.38)	23 (8.85)	17 (6.54)	71 (27.31)	122 (46.92)	3.915	5
5	Do Not Know How To Use Electronic Respires	16 (6.15)	26 (10.00)	28 (10.77)	89 (34.23)	101 (38.85)	3.896	7
6	Internet Speed is Slow-Hardware, Software	19 (7.31)	28 (10.77)	17 (6.54)	94 (36.15)	102 (39.23)	3.892	8
7	Language And Technological Barrier	14 (5.38)	29 (11.15)	15 (5.77)	85 (32.69)	117 (45.00)	4.008	3
8	Few Information Sources are Very Expensive	13 (5.00)	27 (10.38)	18 (6.92)	84 (32.31)	118 (45.38)	4.027	2
9	Low Configuration Computer Systems Inside the Library	12 (4.62)	25 (9.62)	21 (8.08)	79 (30.38)	123 (47.31)	4.062	1
10	Adequate Numbers of Computer Systems	19 (7.31)	21 (8.08)	19 (7.31)	86 (33.08)	115 (44.23)	3.988	4

6. CONCLUSION

Now a days, due to the development of Information communication technology the academic libraries provides the variety of services through the E-Infrastructures. When comparing the sources from printed collection the E-collections are dominated the users as well library professionals. In these circumstances, In these circumstances the academic libraries must improve the E-Infrastructures to fulfill the needs of entire users communities.

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Scientometric Analysis of Astrophysics Research Output in India (Period 1989-2014)

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Abstract

This study analyzes the Astrophysics research output in India from the year 1989-2014. The data was downloaded from web of science database which was maintained by Thomson Reuters. The findings of the study revealed that Tata Institute of Fundamental Research has the maximum number of publications with 1743 Astrophysics research output. In the ranking of authors, Banerjee has produced the maximum number of publications with 349 records; having a global citation score of 5469 and a Local citation score of 331.

Keywords: *Astrophysics, Histcite, Scientometrices, Web of Science*

1.INTRODUCTION

Astrophysics is a branch of space science that applies the laws of physics and chemistry to explain the birth, life and death of stars, planets, galaxies, nebulae and other objects in the universe. Astrophysics creates physical theories of small to medium-size structures in the universe. Astrophysicists seek to understand the universe and our place in it. At NASA, the goals of astrophysics are "to discover how the universe work, explore how it began and evolved, and search for life on planets around other stars."

Birnholtz, J., Guha, S., Yuan, Y.C., Gay, G., and Heller, C (2013) [1] have described Institutions that are spread across multiple geographic locations face additional challenges. To better understand the nature of cross-campus collaboration within a single institution and the effects of institutional efforts to spark collaboration, they conducted a case study of collaboration at Cornell University using scientometric and network analyses. Nishy, P et.al. (2012) [2] have studied the Indian Journal of Chemistry, Section B during 2005-2009 and have been analysed using various scientometric parameters like geographical distribution, citations received each year, authorship patterns, etc. Builova and Osipov (2011) [3] have briefed information and analytical survey of the papers that were submitted to the Third International Nano technology Forum that was held in Moscow on November 1-3, 2010. Scientometric data on the participants, their origins by region and research center, as well as an analysis of the achievements and problems of Russian research on nano technologies, are given. Raja et.al. (2011) [4]have analyzed plasmodium falciparum research publication in India measured from Histcite software and other tools. The results show that the growth of Indian literature in plasmodium falciparum deposition and make the quantitative assessment of the research in terms of year-wise research output, geographical distribution, nature of collaboration, characteristics of highly productive institutions and the channel of communication used by the scientists. Vitzthum ,K et al. (2010) [5]analyzed Environmental Tobacco Smoke Research a total of 6580 articles were analyzed during the period 1900 – 2008. The first article was published in the year 1964. Using different scientometric approaches, a continuous increase of both quantitative and qualitative parameters was found. The combination with density-equalizing calculations demonstrated a leading position of the United States (2,959 items published) in terms of quantitative research activities.

2.OBJECTIVES

i. To analyze the year wise publication of astro physics research output in India.
ii. To find out the authorship pattern and degree of collaboration
iii. To identify the ranking of authors based on publication.
iv. To examine the contribution of journals in this field.
v. To determine the contribution of institutions to astrophysics research in India

3.METHODOLOGY

The data for the study were retrieved from web of science database which is a scientific and indexing

service maintained by Thomson Reuters. The Astro Physics research output of India was analyzed. The bibliographic details such as authors, document types, collaboration etc were analyzed using Histcite which is a software package used for bibliometric analysis and information visualization.

4.ANALYSIS

A total of 12750 astro physics records were published in India. The research output was analyzed using various scientometric indicators.

4.1 Year-wise Publications

Table 1 shows the year wise distribution of Astrophysics research output in India from the year 1989-2014. A total of 12750 records were published during the given period. The highest number of publications is in the year 2013 with 913 records, having a Global Citation score 4342 and Local Citation Score of 324,followed by 896 papers in the year 2014 with Global Citation score of 3287 and a Local Citation Score of 88. The year 2006 has scored the maximum Global Citation Score of 12066 with 554 publications. The lowest number of publications is in the year 1995 with 285 records, having a Global Citation Score of 878.It is also observed from the table that even minimum numbers of records have scored higher Global Citation Scores.

4.2 Authorship Pattern and Degree of Collaboration of Astrophysics Research Output

The above table indicates authorship pattern of Astrophysics research output by India from the period 1989-2014.It is clearly noticed from the table that Two authors has the maximum of contribution with 3673 (28.81%) publication. It is also noted that out of 12750 publications only 58(0.45%) publications are contributed by Ten authors.

4.2.1 Degree of Collaboration:

To determine degree of collaboration in quantitative terms, the formula given
by K. Subramanyam (1983) was used.the formula is $\mathbf{C=N_M/N_M+N_S}$. Where C= Degree of collaboration, NM = Number of multi authored papers, NS = Number of single authored papers.
In the present study the value of C =10933/12750, *C* =0.86.
A study of the above data indicates the degree of collaboration in the Astrophysics research output in India. The degree of collaboration is 0.86 during the period 1989 to 2014 ie out of the total 12,750 articles published 86 percentage of them are published under united venture.

Table 1 Year-wise Distribution of Astrophysics Research Output

Sl. No.	Publication Year	RECS	TLCS	TGCS
1	1989	320	572	2361
2	1990	377	758	3434
3	1991	383	702	3616
4	1992	331	554	2804
5	1993	389	963	4904
6	1994	369	985	5997
7	1995	285	878	4245
8	1996	300	977	6688
9	1997	355	884	5200
10	1998	323	904	6647
11	1999	333	900	5297
12	2000	355	1011	6967
13	2001	423	1042	7771
14	2002	422	992	11018
15	2003	400	1113	10796
16	2004	395	1035	9109
17	2005	418	1080	8766
18	2006	554	1543	12066
19	2007	566	1009	8861
20	2008	625	1034	9813
21	2009	647	1133	10575
22	2010	691	865	9049
23	2011	795	657	9055
24	2012	885	483	6902
25	2013	913	324	4342
26	2014	896	88	3287
	Total	**12750**	**22486**	**179570**

Table 2 Authorship Pattern of Astrophysics Research Output

Sl.No.	Authorship Pattern	No. of Publications	%
1	Single Author	1817	14.25
2	Two Author	3673	28.81
3	Three Author	2875	22.55
4	Four Author	1577	12.37
5	Five Author	766	6.01
6	Six Author	355	2.78
7	Seven Author	218	1.71
8	Eight Author	127	1.00
9	Nine Author	101	0.79
10	Ten Author	58	0.45
11	More than Ten Author	1183	9.28
	Total	**12750**	**100**

4.3 Ranking of Authors

The above table depicts the ranking of top ten authors in India. It is clearly seen from the table that Banerjee s has produced the maximum number of publications with 349 records, having a global citation score of 5469 and a Local citation score of 331, followed by Kumar A and LI J with 245 and 221 records, having Global citation scores of 3609 and 5801 respectively.

Table 3 Ranking of Authors by Number of Publications in Astrophysics Research Output in India (Top 10)

Sl. No.	Author	Recs	TLCS	TGCS	Rank
1	Banerjee S	349	31	5469	1
2	Kumar A	245	59	3609	2
3	Li J	221	38	5801	3
4	Choi Y	213	0	3925	4
5	McCarthy R	213	107	7075	4
6	Strom D	204	0	4037	5
7	Hou WS	203	0	3817	6
8	Brown DN	202	0	1944	7
9	Liu Y	197	2	3392	8
10	Aihara H	193	29	4986	9

4.4 Contribution of Journals

The above table reveals the contribution of top ten journals in Astrophysics research output in India. It was found out the journal Physical review stands first with 2880 records, having a Global Citation score of 59477 and a local citation score of 1390 followed by the journal Astrophysics and Space science with 1289 records, having a Global citation score of 6081 a local citation score of 1963.

4.5 Contribution of Institutions

The above table presents the contribution of top 10 institutions to astrophysics research output in India. It is clearly seen from the table that Tata Institute Fundamental Research has the maximum number of publications with 1743 records having a global citation score of 39681 and a local citation score of 3178, followed by Indian institute of astrophysics with 1326 publications, having a global citation score of 16043 and a local citation score of 2888.

Table 4 Contribution of Journals to Astrophysics Research Output in India(Top 10)

Sl.No.	Journal	Recs	LCS	GCS
1	Physical Review D	2880	1390	59477
2	Astrophysics and Space Science	1289	1963	6081
3	Monthly Notices of the Royal Astronomical Society	1252	4307	19220
4	Astrophysical Journal	1124	3574	23336
5	Astronomy & Astrophysics	1040	3003	19791
6	Journal of Astrophysics and Astronomy	411	573	1658
7	Indian Journal of Radio & Space Physics	400	161	784
8	Solar Physics	378	1169	4092
9	Classical and Quantum Gravity	376	1099	7317
10	Journal of Geophysical Research-Space Physics	362	408	3863

Table 5 Contribution of Institutions to Astrophysics Research in India(Top 10)

Sl.No.	Institution	Recs	TLCS	TGCS
1	Tata Institute Fundamental Research.	1743	3178	39681
2	Indian Institute Astrophysics	1326	2888	16043
3	Physics Research Lab	736	1074	7541
4	Raman Research Institute	576	1133	9138
5	Inter. university Center Astronomy & Astrophysics	532	1425	13013
6	Indian Institute Technology	522	749	5502
7	CALTECH	475	452	19317
8	University of. Delhi	460	300	7000
9	IUCAA	422	1160	11025
10	Indian Institute of Science	418	962	6671

5. CONCLUSION

The Astrophysics research output in India as evidenced from the study has the highest publication of 913 papers in 2013 with 4342 Global Citation Scores followed by 896 papers in 2014 with 3287 Global Citation Score and 885 papers in 2012 with 6902 Global Citation Scores. The research shows that Two authors has the maximum of contribution with 3673 (28.81%) publication. And followed by three author 2875(22.55%). The degree of collaboration is 0.86.The study reveals that Banerjee has produced the maximum number of publications with 349 records, having a global citation score of 5469 and a Local citation score of 331. The study envisages that journal Physical review stands first with 2880 records, having a Global Citation score of 59477 and a local citation score of 1390 followed by the journal Astrophysics and Space science with 1289 records. Tata Institute Fundamental Research has the maximum number of publications with 1743 records having a global citation score of 39681 and a local citation score of 3178.

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Evaluation Rubrics for School Library Blogs: A Case Study of Three Kendriya Vidyalayas

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Abstract

The library and information science professionals are in the world of biblioblogosphere. Every library needs to be there with their own web presence techniques. Blogs are the easy-to-go web 2.0 tool that can be employed by the libraries to reach their online users at their desktop to fulfil their information needs. School libraries stand next to none in adopting this blogging platforms to reach their school fraternity When the quantum of blogs of get boomed up, it is essential to draw a set of evaluation rubrics to assess the quality of blogs in terms of their technical aspects and contents. What should be the appearance of school library blogs, how should the pages be arranged , what kind of links should of made available, in what way home page is to be planned, what should be the coherence between the contents and the pictures in a page, what kind of technical aspects are to be taken care of, what about the relevancy and currency of the contents, how well the blog is searchable, how functional and unique is the blog, how helpful the school library blog is are the few components of evaluation rubrics discussed in this paper, that are required to assess the quality of school library blogs. Also this paper illustrates these evaluation rubrics with the help of screen shots of library blogs of KV No.1 Narimedu, Madurai, KV No.2 Calicut and KV Pattom, Trivandrum (Shift 1).

Keywords: *Currency, Contents, Evaluation rubrics, Format and appearance, Kendriya Vidyalaya, Relevancy, School library blogs, Searchability.*

1. BLOGS

A Blog can take the form of a diary, journal, what's new page or links to other websites ' - Peter Scott (2001). A weblog is a dynamic, flexible tool that is easy to use whether you are creating with it or simply viewing the results - Richardson (2004). A weblog or blog is a frequently updated website consisting of dated entries arranged in reverse chronological order so that the most recent post appears first - Jill Walker

2. LIBRARY BLOGS & SCHOOL LIBRARY BLOGS

The interactive web pages of a library which is frequently updated showing the posts in the reverse chronological order are called as Library Blogs. A library blog maintained either by the school authorities or the school librarian designed specially to cater to the needs of the students and teaching community of a particular school environment may be defined as a School Library Blog.

3. QUALITY OF SCHOOL LIBRARY BLOGS

According to Poll (2005), the quality of a library website can have different aspects: contents, language, structure, design, navigation and accessibility. The most important issue when designing a school library's website is to consider the special needs, competences and behaviour of the individual library's population i.e. students and staff.

4. KENDRIYA VIDYALAYA LIBRARY BLOGS

Libraries in the Kendriya Vidyalayas are in the forefront in introducing virtual school library spaces i.e. library websites / blogs for their users. KV Pattom, Shift I , Trivandrum is the first school library blog of the whole Kendriya Vidyalaya Sangathan, an autonomous body which runs around 1000 KVs all over India and abroad. Now, more than 100 KVs have their own blogs in various domains. For the purpose of showcasing the evaluation rubrics of school library blogs, three Kendriya Vidyalayas are taken for the study.

They are:

i. www.kv1madurailibrary.wodpress.com (24.5 lakh online hits)
ii. www.librarykvpattom.wordpress.com (38.5 lakh online hits)
iii. www.librarykv2calicut.wordpress.com (41.6 lakh online hits)

5. EVALUATION OF TECHNICAL AND VISUAL ASPECTS VS CONTENTS OF THE PAGES

5.1 Technical and Visual Aspects of the Page

i. Does the page take a long time to load?
ii. Do any pictures or photographs on the page add to the information?
iii. Is the spelling correct on the page?
iv. Are there headings and subheadings on the page?
v If so, are they helpful?
vi. Is the page signed by the author? ; Is the author's e-mail address included?
vii. Is there a date on the page that tells you when it was last updated? ;
viii. If so, is it current?
ix. Is the format standard and readable with your browser? ;
x. Is there an image map (large clickable graphic with hyperlinks) on the page? ; On supporting pages, is there a link back to the home page?
xi. Are the links clearly visible and annotated or explanatory?

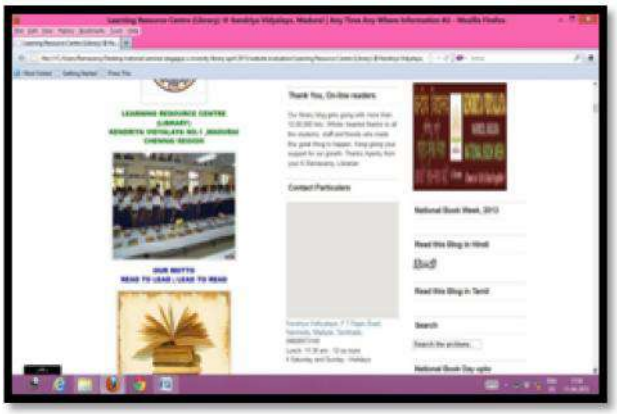
5.2 Content

i. Is the title of the page indicative of the content?
ii. Is the purpose of the page indicated on the home page?
iii. Can you tell when the document was created?
iv. If there is no date, does the information seem to be current?
v. Does up-to-date information matter for your purpose?
vi. Is the information on the page/site useful for your purpose?
vii. Did the information lead you to other sources, both print and Web, that were useful?
viii. Is a bibliography of print sources included?
ix. Does the information appear biased? (One-sided, critical of opposing views, etc.)
x. Does the information contradict something you found somewhere else?
xi. Do most of the pictures supplement the content of the page?

6. CRITERIA FOR EVALUATING CONTENT OF WEB SITES

6.1. Questions about Authority

Who is responsible for the content (The author? The publisher?) ; What is the affiliation of the author? Who is the author's employer? Is this affiliation clear on the web site or is it hidden? ; What is the reputation of the blog publisher? ; Is there contact information for questions? ; Is the information on the author or the publisher verifiable? ; Who developed the site?; Who is the sponsor/what is the location of the site?



6.2 Questions about the Audience

Is the purpose of the site made clear? ; Is the target audience identified? Is it for students? An interested individual? A casual web surfer? ; Is the content, reading level, graphic presentation and organization appropriate for the content and the audience? ; Does the information meet the needs of the intended audience? Is it enough information? Too much?

6. 3 Questions about Context/Coverage

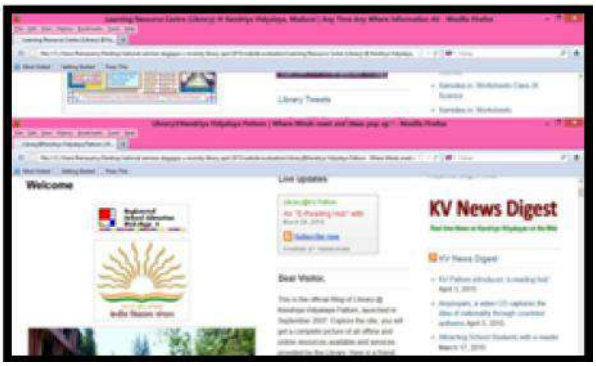
What is the persuasive approach used, if any? ; Is there one point of view presented? Are there multiple perspectives offered? ; Is there evidence of bias? ; Are there linkages to other sites that have discussions on this topic? ; Are links to other sites restricted to sites that only agree with the point of view offered in the site you're examining? ; Does the site or the article provide sources for the information and then link to those sources? ; Is the discussion in depth on the topic or superficial?

6.4 Questions about Accuracy

Are studies/sources of data referred to and obtainable (on-line or through a library)?; Are there comparison data or studies available and mentioned?; Has the document been subjected to a peer review process? How could you know this?; Are the data primary (original research) or secondary (modified, selected, or reported from another study)? ; Is there a bibliography or references cited section? ; Is the site maintained by a university, governmental agency, or other reputable organization?

6. 5 Questions about Currency

Is the information using the most currently available data?; Is the information current— meaning does the information carry the weight of current agreement in the school community? ; Are the data and the findings relevant today given changes in society, knowledge, or technology?



7. CRITERIA FOR EVALUATION OF CONSTRUCTION OF WEB SITES

7.1 Format and Appearance

This criterion relates to the design aspects of the site. One of the first questions to ask is "is the organization of the site easy to figure out? Do I know what's where on this site?" Similarly, one should be able to find the information where it is expected and not have to go through several pages to find the information. Do the navigation buttons lead where they should or do they take the searcher to information that is not expected? Of course, basic design principles of layout, appropriate graphic use, speed of loading graphics, editing control (how careful is the site in terms of spelling, grammar, wordiness, etc), and general attractiveness and usability are all part of the format and appearance.

7.2 Functionality

How usable is the site? Functionality refers to the usefulness and user-friendliness of the site. The first questions asked regarding functionality relate to the appropriateness of the site to the searcher's needs— is this site going to have the information that is expected? Next, the searcher should examine the homepage and deeper level pages in terms of ease in moving through the site and returning to the homepage. Does the site let you move easily from one page to another?. As above, do the links take you where they should?.

7.3 Searchability

Increasingly, sites are designed to let you search within the site without going to a provider's search engine. Evaluation of searchability is based on the complexity of the search, the numbers of modifiers able to be used in the search, the domains (author, title, subject, key words, word) used for searching, and the speed in which the search takes place. One trick to use to evaluate searchability— find names, titles, subjects, key words, and words from pages deep within the site. Return to the homepage and do searches to find those search terms you identified. Does the search take you to those pages?

7.4 Uniqueness

In searching, we want both commonly accepted information and at the same time, we want sites that are unique. To evaluate uniqueness, we can ask questions such as: is the information common in *other* formats? Is the site easy/difficult to locate? Is this site/information unique to the net? Is this site/information unique *on* the net? Does this site/information compliment other materials?

7.5 Help for Visitors

In evaluating sites, the user-friendliness is important. There are the technical considerations (such as platforms required for access to or using different sites) and the graphics programs needed to view different sites. Check the availability of site searcher aides such as direct links to the site manager or authors (e-mail links); site visitor feedback or dialogue areas; help or search buttons at various or all pages/levels of the site; clearly identified home page return buttons on all pages; and clearly identified links within the page. The numbers of links and the types of links from the site to other similar or related sites is an important consideration in evaluation. These links also will reveal the bias of the site or the purpose of the site. Many of the citations in the bibliography have in-depth discussions on evaluation of web pages. These would be excellent resources to extend the evaluation of information to the context of the information.

8. HOME PAGE EVALUATION

The most important part of a website is its homepage. "A company's homepage is its face to the world and the starting point for most user visits."

A library's homepage should
• guide quickly to frequently requested information,
• serve as efficient sign-posting to the services,
• apply user-friendly terminology,
• give an overview without confusing users.

If the homepage does not correspond to users' needs and terminology, they will either leave quickly, or they may spend much time by "clicking the wrong link and being lost forever in the wrong part of the site". The goals are to keep information on the homepage short and concise and yet to offer an overview of all services. Information on the homepage should be limited to the necessary.

9. HOW TO GET A BETTER HOMEPAGE (POLL, 2007)

i. By using an evaluation method, the library will probably find specific shortcomings of its homepage.
ii. There are some general issues that should be considered for a homepage: Frequently asked questions: Many libraries put a FAQ option on their homepage that lists frequently asked questions and their answers ; Options for different user groups: Different user groups may have different needs and a different level of experience that will influence their search. The library should therefore offer options for different user groups on its homepage. first-time visitors, secondary students, Senior secondary students, teachers and external users.
iii. The language of the homepage – and of the whole website – should conform to user needs. Library "jargon" should be replaced by terms users understand: Abbreviations should be avoided, if the users are not quite familiar with them. Terms should be used consistently. If specific library terms cannot be avoided, they should be explained.

10. WHAT CAN "WEB 2.0" ADD?

When libraries speak of offering web 2.0 services, they generally mean that they make use of "social software" for offering new services or old services in a new form.

11. METHODS OF EVALUATION OF WEBSITES

There are different methods for evaluating the usability of a website: (Poll 2007)

11.1 Evaluation with User Participation

i. Web surveys: Surveys ask for satisfaction rates, purposes of a search, problems in searching, etc.
ii. Focus groups: The website is discussed with a small group of website users who talk about their experiences and problems.
iii. Group tests: Groups work on specified tasks, moderated by an expert.
iv. Thinking aloud: A test user's verbalizing his or her thoughts when searching is recorded on tape.
v. Observation: Users perform a set of tasks and are observed either by video or by an observing person.
vi. Transaction logs: Evaluation of use data as to frequency of use, most-used pages, ways of searching, etc.

11.2 Evaluation without User Participation

i. Heuristic evaluation: A small group of experts evaluates the website, based on the principles of usability.
ii. Cognitive walk-through: Experts construct a "user scenario" and perform tasks of an imaginary user.

12. WEB SITE EVALUATION TECHNIQUES

i. **Relevance Questions:** Does this site provide the type of information I need?
Techniques: Look for a Site Index, Site Map or Table of Contents page to get a quick sense of what's available.
ii. **Purpose Questions:** Is the purpose to inform or provide news, to explain or document, to persuade, advocate, or sell?
Techniques: Examine "About this site" pages for an indication of intent.
iii. **Authority Questions:** Does the author have appropriate education, training, or experience to write with authority on this topic?
Techniques: Look for a linked biographical statement, resume, or background on the organizational "author"; Check for other writings by or about this author (use the Library's online catalog or online periodical indexes).
iv **Publisher or host Questions:** Is this an official or unofficial site? Does the Internet host site or "publisher" offer links back to this site from its own pages?
Techniques: Follow links back to host site page or enter URL for the top level domain.
v. **Content accuracy, bias Questions:** Are the sources of information presented at the site clearly indicated? What types of resources are used to support arguments? Does the author attempt to substantiate controversial claims? Are there references to alternative points of view? Is the author affiliated with any organization that may have a "vested interest" in the topic?
Techniques: Examine linked sources to determine if they present a balanced; point of view or substantiate claims; Compare to other web sites or to online/printed resources on the same topic.
vi. **Coverage Questions:** Do other sites cover topics or aspects that are missing from this site?
Techniques: Compare to other web sites on the same topic.
vii. **Currency Questions:** Can you tell when material was written? Is the site well maintained (e.g. links functional)? Is there evidence of newly added information or links?
Techniques: Look at page creation, revision dates; Check any "What's New" pages.
viii. **Recognitions Questions:** Has this site been generally recognized by others as reliable, either in reviews, comments, or by the implicit acknowledgment of others linking to it? How did you locate it initially - from a reference in an online "guide" source or by a keyword search?
Techniques: Look at any formal evaluations or reviews of the site; Search for other sites which have linked to this page.

13. CONCLUSION

The main criteria for quality of a library website can be summarized thus: Adequate language (to the population) ; Clear structure ; Options for different user groups; All information up-to-date; Short, concise information. The most important issue is probably, that the website, especially the homepage, should guide by the shortest possible way to the most-used information: Let's assure that our users follow the line of minimum effort.

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Impact of Social Networking Sites in Pondicherry Engineering College: A Study

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Abstract

The developments in the field of information and communication Technology (ICT) have changed the world information scenario. Earlier, the internet used to provide a limited set of services suchs as searching, browsing, emailing, chatting, etc., but now it has expanded enough to become an integral part of our routine. Social networking is a common phenomenon among the students, used to interact with their family and friends rather study in the libraries. The present is an attempt to know the use and awareness among the students. As the librarians are worried about the internet in the libraries, this study may provide a solution for this problem.

Keywords: *ICT, Networks, Social Networks*

1. INTRODUCTION

The Social networking sites (SNS are originated from the web which is a popular medium for publishing, sharing, communication and disseminating the information. The web was invented by Tim Berners Lee at CERN in Geneva in 1999. The first version of web known as web1-0 that was able to provide the facilities of clients – server model and hyper- linking of the information however, it was a static web which provides not – attractive environment enabled only one – way communication. the emergence of new technologie s, web has entered in the advance stage known as web 2.0. The applications of web 2.0 facilitate the users to share information and provide a collaborative environment on the Internet. The web2.0 permits to view, edit and produce the content on website and supports the user to interact with content creators by sharing views and opinions. The Social Networking is an application makes the most of intrinsic advantages of online discussion. The delivering software used to update their services for better use by the users. The consumption and remixing of date from multiple source while providing services in a form that allows reporting by others creates network effects through an "Architecture of Participation and going beyond the user experiences. There are several tools of web 2.0 technologies like blogs, wikis, Really Simple Syndications (RSS), Instant Messaging, podcasting, Tagging, Book Marking and Mashups, etc., the social Networking Sites are also the one among them.

2. SOCIAL NETWORKING SITES, CONCEPTS AND EXPLANATION

Social Networking is an assemblage of individuals in to specific groups of e.g. Students particular stream. It is a relationship between People who belong to different region but with the same purpose. Social Networking is possible in schools, colleges, Universities or in the work place among the people of same group. It is popular channel in the Internet where it comes to online using websites. These are known as social Networking sites. Therefore .it is an online community of users on the internet. The socialization means reading the Pro? Ie of other users giving view on social issues or even contacting with them, these are web based services that allow the users to create own Profile of the interest and share with other like friends, colleagues, professionals scattered relations etc. The online community on the websites share common things such as news, hobbies, religion, culture etc. the internet joins individuals and allows access to all around world on social networking sites. It is estimated that nearly about 300 social networking websites are available on the internet. The membership of these websites is open to all; anyone can become a member.

3. DEFINITION OF SOCIAL NETWORKING SITES (SNSS)

Boyd and Ellsion: Social networking site are web based services that allow individuals to

1. Construct a public or semi – Public Profile within a bounded systems
2. Articulate a list of others user with whom they share a connection.
3. View and traverse their list of connections and those made by others within the systems.

From the above it is clear that social networks are new means of communication and sharing information between two or more individuals on an online community.

4. OBJECTIVES OF THE STUDY

1. To know the purpose and awareness among the scholars to extent of using the social net working.
2. To find out the availability of infrastructure in selected population focusing social networking facility for scholars.
3. To find out the most popular websites among the scholars
4. To study the problems being faced by researchers in using these sites.
5. To analyse the merits and demerits of social net working sites.

5. LITERATURE OF REVIEW

Boyd and Ellison (2007) describe the comprehensive concept, definition and features of SNS sites it also presented the historical development of these sites and changes which were happened over time. It also discussed the recent scholarship on SNS, highlights Key work and giving the suggestions for further research in concerned areas. Kluemper and Rosen (2009) evaluated use of social networking website in employment selection through accessing the personal profile of candidates on the sites. This study was conducted at large level in southern USA. Pempek, Yermolayeva and Calvert (2009) it is found the use of social networking sites by college students. it also evaluated how much why and how they use sites. Results show that face book is most popular website among young adults. Mahajan (2009) explored that the usage, impact and problems related to SNSs and its impact on the social and cultural value of india. It also describe top most social networking websites of India. Bicen and Cavus (2010) Evaluated that the internet usage of students in the computer education instructional technology and found which social networking sites preferred by the students. The study reveals the use and sharing of knowledge on internet is made an integral part of our lives.

6. SCOPE OF STUDY

The Pondicherry Engineering College was established during 1985, and conducting various courses and research programmes. The undergraduate, post graduate and research programmes are offered in Engineering, Science in full and part time basis. Specifically B.Tech Civil, Mechanical, Electronics and Communication, Computer Science, Electrical and Electronics, Electronics and Instrumentation, information Technology, chemical, Environmental engineering and various Engineering post graduation courses are offered in addition to some of the post graduate and research programmes in Science and Humanities.

7. METHODOLOGY

This study is based on a survey in Pondicherry Engineering College, Puducherry among the M.Tech, M.phil and Ph.d scholars of PEC by well structured questionnaire. Totally 250 questionnaires were distributed in person by the researcher and nearly 195 were received back which is represented in the following Graph.

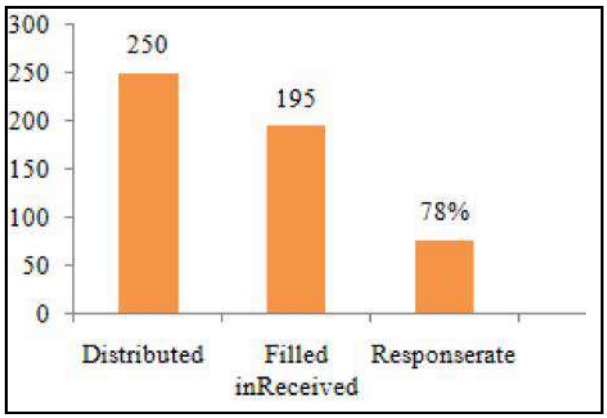

Fig.1 Social networking sites in internet

The above Graph 1 shows that the details of questionnaires distributed. Totally 250 Questionnaires were distributed, out of which 195 filled in were received, the response rate is 78%.

8. DATA ANALYSIS AND INTERPRETATION

The collected data through questionnaires have been organized and tabulated by using the statistical tool viz Chi – Square Test and their interpretations have been given in the following graphs.

Figure 2 reveals the Gender wise description of the population which shows out of 250 respondents male 65% and female 35 % who are using SNSs

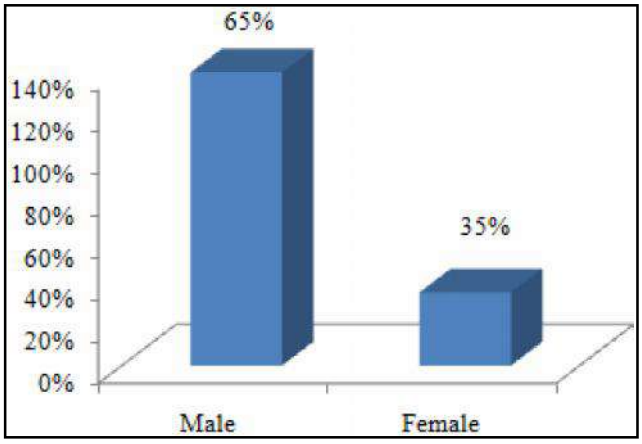

Fig.2 Age Group distribution of respondents

Figure 3 indicates tha age wise data of respondents. Id show that 80% of respondents' between the age of 20-30, who are using most of these sites, the age group 30-40 were 17% and the age group 40-50 were only 3%.

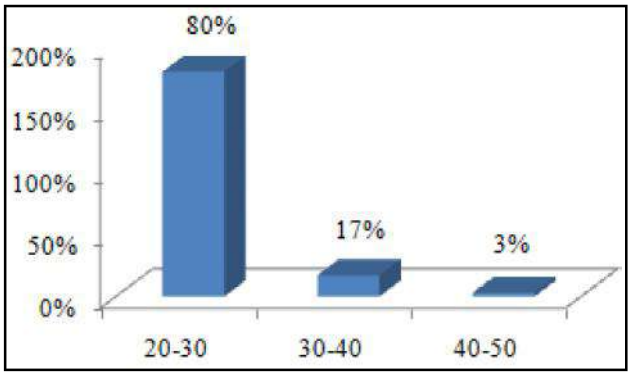

Fig.3 Age Group Distribution of Respondents

Figure 4 Shows the generally used SNSs among the respondents, which indicates 52%use face book, 5%use ourkut, 11% use Twitter,8%use Youtube, 5% use Google Buzz, 7% use yahoo,4% Use Blogger.com, 3% use Myspace and 3%use Friendster,2% use Beba, It may be noted that the use of face Book is Teading Among SNSs.

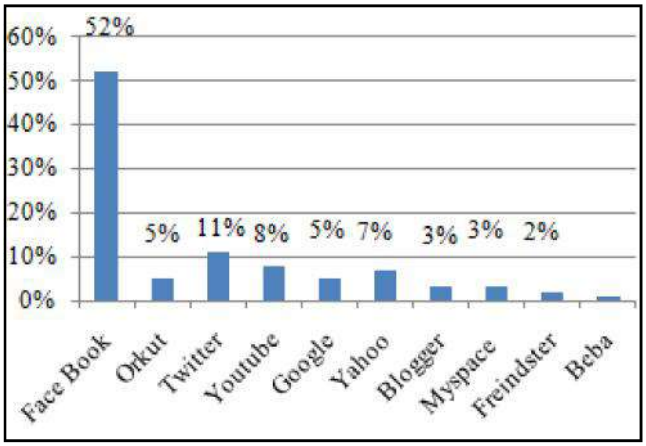

Fig.4 Most commonly used SNSs

Figure 5 reveals that devices that are used for accessing SNSs. It shows that 15% of the respondents are using PC and 40% of them are using laptop and 55% using Smartphone for accessing SNSs, Smartphone use is lading among the tools of SNSs.

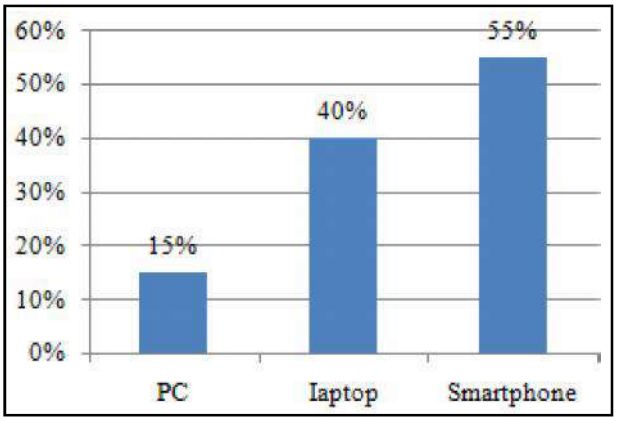

Fig.5 Tools of SNSs

Figure 6 shows the period for which the respondents accessing SNSs.20%of students using the SNSs for 1-6 monts, 58% of them using it from 6months -1 year, 12% using 1-2years and 10%using it from 2-3 years. Hence the research scholars are using it for long time 2-3 years.

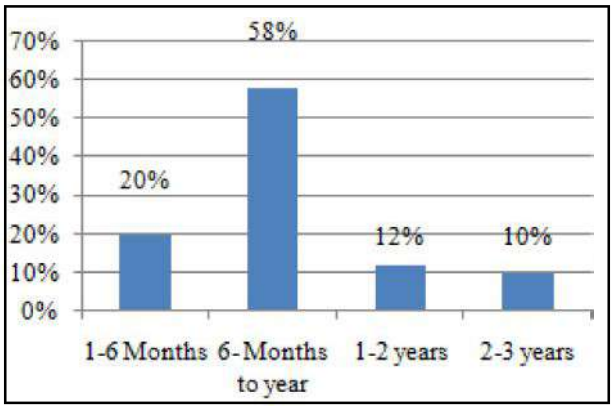

Fig.6 Period of Using SNSs

Figure 7 reveals the use of SNSs by the respondents in a day. It shows that 20% of the respondents use the SNSs from 1-2 hours and 55% of the Respondents using them between 2-4 hours, 25% of the Research scholars using SNSs between 4-6 hours per day.

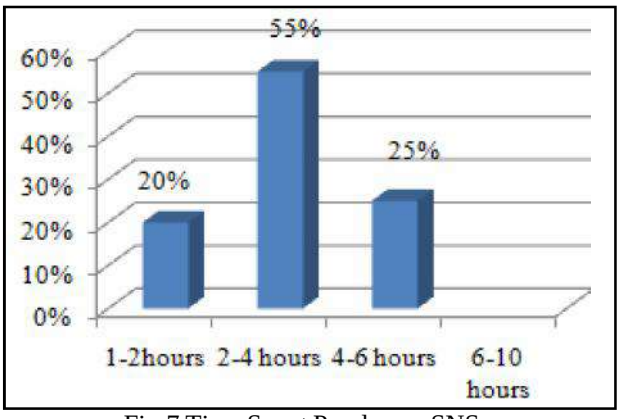

Fig.7 Time Spent Per day on SNSs

Figure 8 reveals that an important functions of SNSs. It shows tha 40% of them using for profile sharing 5% of members sharing videos, 14% are sharing photos and 12% are creations events, 8% are group searching, 10% using for friends searching 11% using it as Message Board.

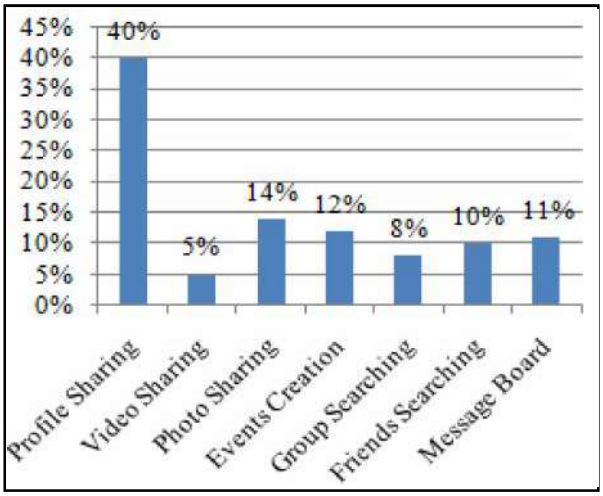

Fig.8 Use full Functions of SNSs

Figure 9 shows that the purpose of using SNSs. It is revealed that out of 195, 50% of them are using for academic purpose and 10% for Entertainment, 15% for sharing experience, 20% making friends. It also found that 5% of them ways keeping themselves up to date in their routine and interacting with friends regularly.

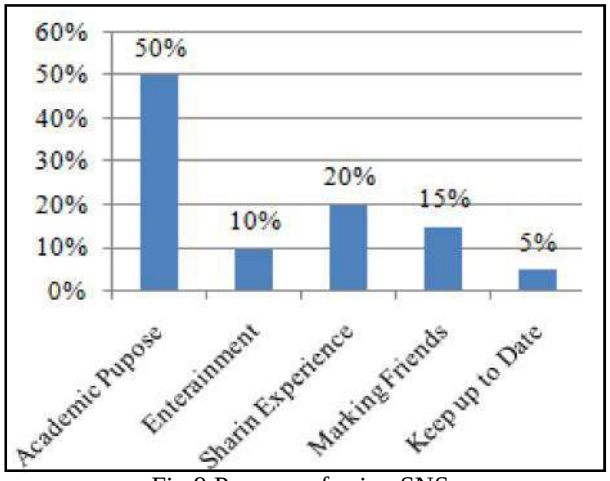

Fig.9 Purpose of using SNSs

9. FINDINGS

i The Study found that the majority of users are between the age group of 20-30 years
ii The face book is the most popular among SNS followed by Twitter.
iii The use of smart phones as a Tool to access SNSs are very high when compared with Pcs, Laptops.
iv The main purpose of using SNSs is interacting with friends and sharing professional information.
v The main purpose of using SNS is searching for friends, Updating personal and professional profile, posting message and sharing videos and Photos.
vi The study found that using SNS is not a new phenomenon among researchers who are using them for long time ie 2-3 years
vii Research reveals that 25% researchers use SNSs up to 6 hours per day
viii An important finding of the study is that use of SNSs is time consuming.
ix According to response, the need of SNSs is highly felt to communicate with family and friends and search information
x Study found that the use of SNS is very easy
xi Social networking sites are very useful and helpful especially among aluminai to communicate.

10. CONCLUSION

The Popular concept of social Networking Website is associated with broader context of web 2.0 which is recent phenomenon among scholars. These are providing various ways to interact the users with each other, several features of the sites like profile surfing, posting of message, photo, video, making friends join communications etc., are the medium by which scholars

keep themselves updated and share information. It is an area of common interest of libraries and information Technology, where it can be supplement of each other. The benefits of SNS can be utilized for implementing new services in libraries. Researchers also utilize these facilities, finally, we can conclude that this technology may use either way whether it is positive of negative.

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Scientometric Mapping of Bluetongue Virus

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Abstract

An analysis of 1167 publications published by scientists on Blue tongue during 1989-2014 and indexed by Web of Science online Database indicates that the publication output in the Global Research Publication. The highest numbers of papers were published during the year 2014 with 117records and the following year 2013 with 101 records there were contributions. The least number of papers was recorded during 1989 and 1990 with 2 records. Overall, 3260 authors contributed 226 publications in the journal and Institutions with 1081 records of the articles. Using the VOS viewer analyzing of co-author, co-citation, institutions and document wise distribution of publications of clustering of dimension can be drawn.

Keywords: *Bluetongue, Virus*

1. INTRODUCTION

Bluetongue disease is a non-contagious, insect-borne, viral disease of ruminants, mainly sheep and animal husbandry. It is caused by the Bluetongue virus (BTV). The virus is transmitted by the midge Culicoides imicola, Culicoides variipennis and other culicoids. In sheep, BTV causes an acute disease with high morbidity and mortality. BTV also infects goats, cattle and other domestic animals as well as wild ruminants. Some animals also develop foot lesions, beginning with coronitis, with consequent lameness. In sheep, this can lead to knee-walking. In cattle, constant changing of position of the feet gives bluetongue the nickname The Dancing Disease. Torsion of the neck (opisthotonos or torticollis) is observed in severely affected animals. Bluetongue is caused by the pathogenic virus, Bluetongue virus (BTV) of the genus Orbivirus, of the Reoviridae family. Twenty-six serotypes are now recognised for this virus.

2. VOS VIEWER

VOSviewer is a software tool for constructing and visualizing bibliometric networks. These networks may for instance include journals, researchers, or individual publications, and they can be constructed based on co-citation, bibliographic coupling, or co-authorship relations. VOSviewer also offers text mining functionality that can be used to construct and visualize co-occurrence networks of important terms extracted from a body of scientific literature.

3. OBJECTIVES

The main objective of this study was to use Scientometric Mapping of Blue tongue virus with special reference to research activities at global level:

i To identify and analyze the rate of growth of research productivity;
ii To examine the Year wise distribution of publications;
iii To note the Document wise distribution of publications;
iv To analyze the authorship pattern and examine the extent of research collaboration
v To identify journal wise distribution of publications;
vi To assess the Institution wise research concentration;
vii To identify Country – wise Collaborative Distribution of Publications;
viii To identify the word wise distribution of publications.
ix To test the law of metrics.
x Mapping of network using VOS viewer.

4. ANALYSIS AND INTERPRETATIONS

4.1 Year-wise Distribution of Publications

To analyze the year wise publication of research on Bluetongue diseases the data has been presented in Table-1. The table depicts the research output in the global level. From the below table, we could clearly see that during the period 1989 – 2014 a total of 1167 publications were published. In the present study the research output on Bluetongue diseases publication is taken as a tool to evaluate the performance at various levels.

Table 1 Shows that Yearly-wise distributions during the year 1989-2014. The highest publication of records with 117 in the year2014 and least records of publication with 2 in the year 1989 and 1990. The calculation with the variance and Standard Variations in 250262.5 and 500.26.

Table 1 Shows Yearly-wise Distributions of Publications

Sl.No.	Year	Records	Percent	TLCS	TGCS	D	D^2	Variance	S.D((σ)
1	1989	2	0.2	8	12	-24	576		
2	1990	2	0.2	53	95	-22	484		
3	1991	29	2.5	326	775	-290	84100		
4	1992	31	2.7	343	646	-279	77841		
5	1993	22	1.9	170	524	-176	30976		
6	1994	46	3.9	522	1098	-322	103684		
7	1995	31	2.7	301	707	-186	34596		
8	1996	35	3.0	313	745	-175	30625		
9	1997	32	2.7	145	637	-128	16384		
10	1998	22	1.9	109	251	-66	4356		
11	1999	20	1.7	70	260	-40	1600		
12	2000	25	2.1	266	822	-25	625		
13	2001	24	2.1	154	508	0	0		
14	2002	21	1.8	278	628	21	441		
15	2003	26	2.2	238	600	52	2704	**250262.5**	**500.26**
16	2004	24	2.1	164	449	72	5184		
17	2005	24	2.1	288	791	96	9216		
18	2006	34	2.9	197	666	170	28900		
19	2007	42	3.6	490	1055	252	63504		
20	2008	87	7.5	943	2179	609	370881		
21	2009	96	8.2	737	1800	768	589824		
22	2010	85	7.3	315	1321	765	585225		
23	2011	95	8.1	231	815	950	902500		
24	2012	94	8.1	143	631	1034	1069156		
25	2013	101	8.7	101	398	1212	1468944		
26	2014	117	10.0	12	124	1521	2313441		
	Total	**1167**				**5789**	**7795767**		

Table 2 shows that the highest publication of doubling time as well as followed by 356.08 and 220.20 in the year of 2005 and 1990.

Table 3 shows that the Average moving publications method as well as followed. It's also calculation on short term fluctuation in 1989-2014. The Total No. of publication records is 1167 and short term fluctuation is 360.5.

Table 4 Shows that the Top 10 author wise distributions of publications during the study period 1989-2014 in the field of Blue tongue virus at Global level. The Total number of author publication in these records with 3260. The highest Productivity of publications goes to Roy P with 50 records and followed by the Mellor PS with 49 records. The least productivity of publications goes to Baylis M and Breard E with 27 records.

Table 2 Showing Exponential Growth Rate and Doubling time in Number of Publication was observed during 1989 to 2014

Sl.No.	Year	Records	Exponential Growth Rate	Log W1	Log W2	R(a)	Doubling Time(DT)
1	1989	2	1.00		0.69	0.69	1.00
2	1990	2	14.50	0.69	0.69	0.00	220.20
3	1991	29	1.07	0.69	3.37	2.68	0.26
4	1992	31	0.71	3.37	3.43	0.06	11.05
5	1993	22	2.09	3.43	3.09	0.34	2.01
6	1994	46	0.67	3.09	3.83	0.74	0.94
7	1995	31	1.13	3.83	3.43	0.40	1.74
8	1996	35	0.91	3.43	3.56	0.13	5.50
9	1997	32	0.69	3.56	3.47	0.09	8.12
10	1998	22	0.91	3.47	3.09	0.38	1.84
11	1999	20	1.25	3.09	3	0.09	7.61
12	2000	25	0.96	3.00	3.22	0.22	3.09
13	2001	24	0.88	3.22	3.18	0.04	17.83
14	2002	21	1.24	3.18	3.04	0.14	5.02
15	2003	26	0.92	3.04	3.26	0.22	3.22
16	2004	24	1.00	3.26	3.18	0.08	8.87
17	2005	24	1.42	3.18	3.18	0.00	356.08
18	2006	34	1.24	3.18	3.53	0.35	1.97
19	2007	42	2.07	3.53	3.74	0.21	3.24
20	2008	87	1.10	3.74	4.47	0.73	0.95
21	2009	96	0.89	4.47	4.56	0.09	7.37
22	2010	85	1.12	4.56	4.44	0.12	5.57
23	2011	95	0.99	4.44	4.55	0.11	6.46
24	2012	94	1.07	4.55	4.54	0.01	49.94
25	2013	101	1.16	4.54	4.62	0.08	9.03
26	2014	117	0.00	4.62	4.76	0.14	4.78
	Total	**1167**					

Table 3 Short term Fluctuation

Sl.No.	Year	Records (Y)	4 Years Moving Publication	2 Years Moving Publication	4 Years average Publications (Yt)	Short term Fluctuation (Y-Yt)
1	1989	2				2
2	1990	2	64			2
3	1991	29	84	4	2	27
4	1992	31	128	31	15.5	15.5
5	1993	22	130	60	30	-8
6	1994	46	134	53	26.5	19.5
7	1995	31	144	68	34	-3
8	1996	35	120	77	38.5	-3.5
9	1997	32	109	66	33	-1
10	1998	22	99	67	33.5	-11.5
11	1999	20	91	54	27	-7
12	2000	25	90	42	21	4
13	2001	24	96	45	22.5	1.5

14	2002	21	95	49	24.5	-3.5
15	2003	26	95	45	22.5	3.5
16	2004	24	108	47	23.5	0.5
17	2005	24	124	50	25	-1
18	2006	34	187	48	24	10
19	2007	42	259	58	29	13
20	2008	87	310	76	38	49
21	2009	96	363	129	64.5	31.5
22	2010	85	370	183	91.5	-6.5
23	2011	95	375	181	90.5	4.5
24	2012	94	407	180	90	4
25	2013	101				101
26	2014	117				117
	Total	**1167**				**360.5**

4.2 Author-wise Distributions of Publications

Table 4 Author-wise Distribution of Publications

Sl.No.	Author	Records	TLCS	TGCS
1	Roy P	50	649	1560
2	Mellor PS	49	1511	3250
3	Mertens PPC	45	784	1694
4	Zientara S	42	381	894
5	MacLachlan NJ	39	533	1185
6	Stallknecht DE	30	234	350
7	Wilson WC	30	271	467
8	Sailleau C	28	297	609
9	Baylis M	27	689	1482
10	Breard E	27	287	680

Bibliometric mapping of co-authorship relations among authors allows for the representation of information in many ways, which make relationships among them easier to understand. Figure 1 show a co-occurrence network map generated from publications of the authors. Several different components including author nodes (circles), co-occurrence weight (circle size), networked relationship clustering (color and proximity), and name of authors (text) are included in a map. The paper co-authorship network is a network expressing existence of co-authorship relation between authors of scientific papers (Roy.P, Mellor and Mertens). In Fig. 1 the circle's color indicates the cluster or group which the authors are associated. Clustering shows the dimension of similarity to other authors in the display. The co-authorship relations are relations representing whether an author have written a paper with another author, typically a paper is written by two or more authors. Analyzing co-authorship information on a larger database of scientific publications will assist in identifying groups of people who work closely together (Roy.P, Mellor and Mertens).

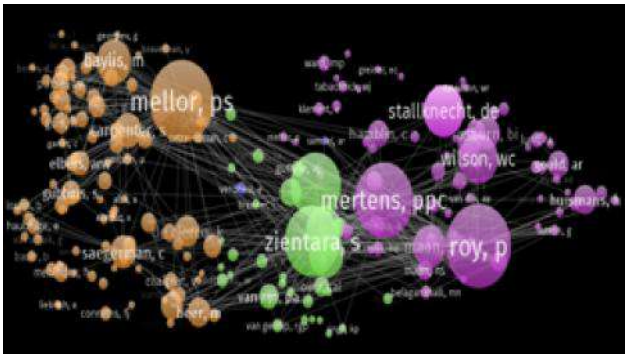

Fig.1 Co-Citation author

Figure 2 shows a co-occurrence network map generated from publications of the first authors only. The paper co-citation with first author is a network expressing existence of co-citation relation between authors of scientific papers (Roy.P, is link with other authors Mellor and Mertens etc.). In Fig. 2 the circle's color indicates the cluster or group which the authors are associated. Clustering shows the dimension of similarity to other authors in the display. The co-authorship relations are relations representing whether an author have written a paper with another author, typically a paper is written by two or more authors. Analyzing co-authorship information on a larger database of scientific publications will assist in identifying groups of people who work closely together (Roy.P, Mellor and Mertens).

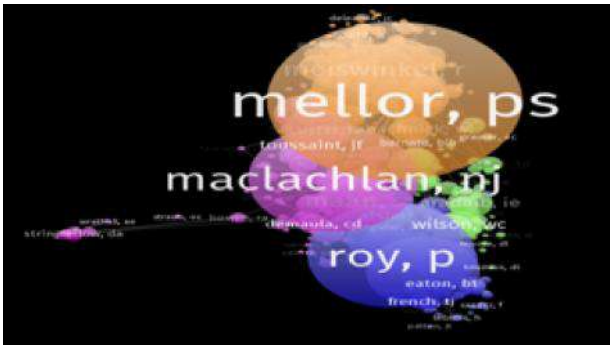

Fig.2 Co-citation with first author only

Figure 3 shows that the co-authorship with co-citation as well as the 203 items of the authors is recording to the 14 clusters follows. Every one clusters including in the 21 items of author's wise publication of the records as well as follows. Differentiated by difference colors of the clusters. Analyzing co-authorship with co-citation of the information on a larger database of scientific publications will assist in identifying groups of people who work closely together.

Fig.3 Co-authorship with co-citation

4.3 Document-wise Distributions of Publications

Table 5 Document-wise Distributions of Publications

Sl.No.	Document Type	Records	Percent	TLCS	TGCS
1	Article	1008	86.4	5442	13974
2	Review	84	7.2	1154	3638
3	Article; Proceedings Paper	27	2.3	98	345
4	Note	19	1.6	152	309
5	Letter	10	0.9	19	50
6	Editorial Material	8	0.7	15	37
7	Meeting Abstract	4	0.3	0	0
8	News Item	4	0.3	15	26
9	Review; Book Chapter	3	0.3	22	158

Figure 4 shows the collaboration network analysis between Document wise distributions of publications of 1134 records has been investigated. That is, the color of a point in a map depends on the 1134 documents is divided by the 7 clusters. Every one Cluster share or divided in the 320 items of the source of documents. The seven Clusters difference between the seven colors.

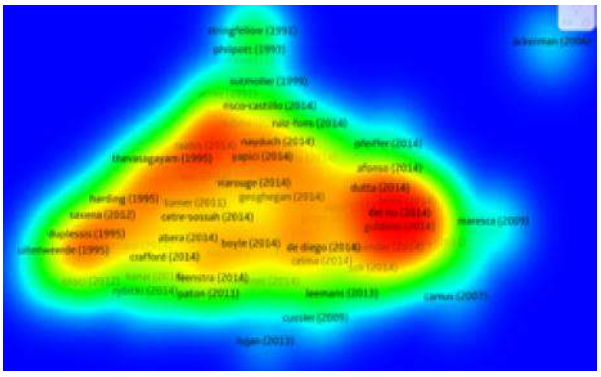

Fig.4 Document-wise distributions of publications

4.4 Journal-wise Distribution of Publications

The study found that the total research output of the Tuberculosis diseases for the study period (1989-2014) published in 226 journals. As the major portion of the research productivity 15 journals that are coincide with the ranking of journals according to the theory of Bradford's Law of scattering of journals in research productivity (Table 6).

Figure 5 shows the collaboration network analysis between Journals wise distribution of publications has been investigated. That is, the color of a point in a map depends on the first 52 items is divided by the 3 clusters in the neighborhood of the point and on the importance of the neighboring items. The density view is particularly useful to get an overview of the general structure of a map and to draw attention to the most important areas in a map.

Table 6 Top 20 Ranking of Journals According to Bradford's Distribution

Sl. No.	Journal	Records	Percent	Rank	TLCS	TGCS	TLCR
1	Veterinary Microbiology	62	5.3	1	371	807	510
2	Journal of Wildlife Diseases	51	4.4	2	256	608	161
3	Plos One	49	4.2	3	0	525	517
4	Preventive Veterinary Medicine	46	3.9	4	385	755	249
5	Virus Research	45	3.9	5	360	645	371
6	Journal of Virological Methods	42	3.6	6	311	693	288
7	Journal of General Virology	35	3.0	7	427	940	236
8	Vaccine	33	2.8	8	279	609	284
9	Medical and Veterinary Entomology	32	2.7	9	244	581	175
10	Veterinary Record	32	2.7	9	293	506	129
11	Journal of Virology	30	2.6	10	215	744	272
12	Virology	26	2.2	11	313	702	152
13	Journal of Veterinary Diagnostic Investigation	22	1.9	12	93	182	149
14	Revue Scientifique Et Technique-Office International Des Epizooties	22	1.9	12	107	321	97
15	Journal of Medical Entomology	21	1.8	13	90	229	91

Fig.5 Journal-wise distributions

Figure 5 shows the collaboration network analysis between Journals wise distribution of publications has been investigated. That is, the color of a point in a map depends on the first 52 items is divided by the 3 clusters in the neighborhood of the point and on the importance of the neighboring items. The density view is particularly useful to get an overview of the general structure of a map and to draw attention to the most important areas in a map.

In a view of institutions, about 1081 institutions published the stent-related journal articles. But the first 96 institutions Institute for Animal Health in USA published 94 papers and University of California Davis (67), University of Pretoria (49), USDA ARS (44) and University of Oxford (39) published as well as follow the papers. Many of institutes are collaborating with each other for a research on stent. Thus, we have used the international collaboration strength (ICS) indicator which is obtained by 'the share of foreign institutions collaborating with a certain institution in its total collaborating'. High quality and high international network where almost the whole top-15 institutions are belonging.

4.5 Top 15 Institution-wise Distributions of Publications

Table 7 Institution-wise Distribution of Publications 1081

Sl.No.	Institution	Records	Percent	TLCS	TGCS
1	Institute for Animal Health	94	8.1	1610	3683
2	University of California Davis	67	5.7	736	1873
3	University of Pretoria	49	4.2	267	655
4	USDA ARS	44	3.8	357	757
5	University of Oxford	39	3.3	622	1539
6	University of Georgia	35	3.0	246	379
7	INRA	33	2.8	134	482
8	CSIRO	32	2.7	225	480
9	University of Alabama	32	2.7	506	1150
10	AFRC	29	2.5	507	1045
11	Onderstepoort veterinary institute	29	2.5	161	439
12	CIRAD	25	2.1	45	227
13	University of Liege	23	2.0	189	424
14	NERC	22	1.9	337	777
15	Friedrich Loeffler Institutes	21	1.8	192	461

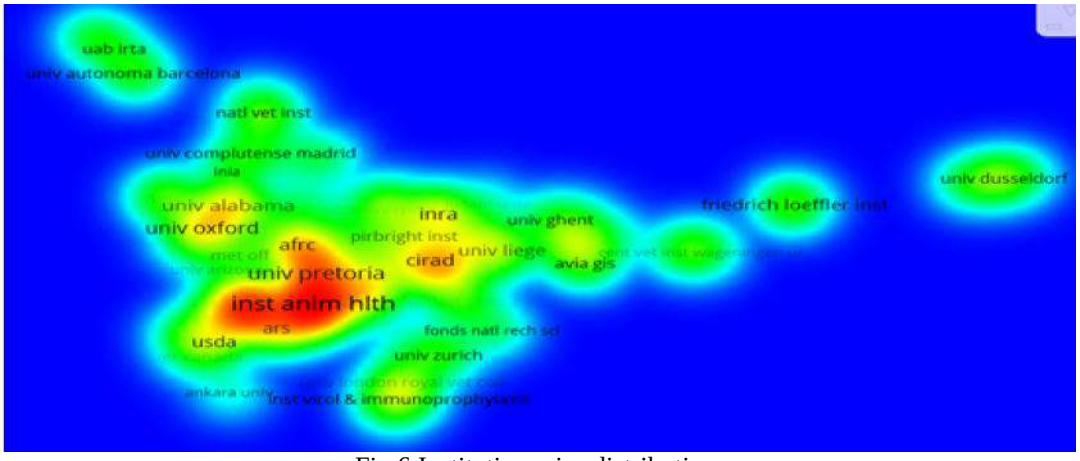

Fig.6 Institution-wise distributions

4.6 Top 15 Words-wise Distributions of Publications

Table 8 Top 15 Ranking of words according to Zif Law's Distribution

Sl.No	Word	Records	Percent	Rank	K	TLCS	TGCS
1	BLUETONGUE	552	47.3	1	552	4712	9990
2	VIRUS	529	45.3	2	1058	3549	8496
3	DISEASE	258	22.1	3	774	1490	3233
4	CULICOIDES	179	15.3	4	716	1128	2854
5	SEROTYPE	154	13.2	5	770	1051	2152
6	EPIZOOTIC	126	10.8	6	756	956	1462
7	HEMORRHAGIC	113	9.7	7	791	859	1269
8	SHEEP	106	9.1	8	848	625	1283
9	AFRICAN	93	8.0	9	837	570	1651
10	DETECTION	90	7.7	10	900	484	1156
11	CATTLE	88	7.5	11	968	507	982
12	INFECTION	86	7.4	12	1032	462	1167
13	DIPTERA	73	6.3	13	949	263	764
14	CERATOPOGONIDAE	72	6.2	14	1008	272	769
15	DISEASES	72	6.2	14	1008	144	938

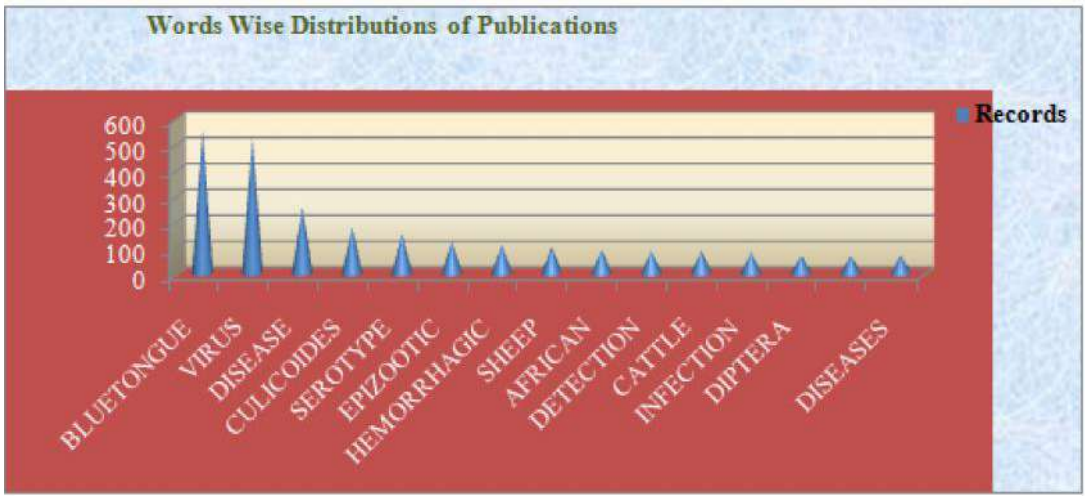

Fig.7 Top 15 Words-wise distributions of publications

The below table 8 shows that total word wise of distribution of publications with 2450 records. Among this the word "Bluetongue" with 552 records and TGCS with 9990 records. The next word follows as "Virus" with 529 records and TGCS 8496 records as well as follows the publications.

4.7 Top 15 Country-wise Distributions of Publications

The below table indicates that among the country wise distribution of BLUETONGUE DISEASES covered by the study tops USA with 301 publications followed by UK with 259, France with 130, South Africa with 90, Germany and Spain with 79 research publications respectively. First place goes to USA with 5935 publications, UK secured second rank in terms of GCS with 7475 records of 72 Countries were contributed the publications.

4.8 Language-wise Distributions of Publications

The below table 10 shows that Language wise distribution of publications. Among this the language "English" with 1099 records and TGCS with 18135 records. The next language follows as "German" with 28 records and TGCS 119 records as well as follows the publications.

Table 9 Top 15 Country-wise Distributions of Publications

Sl. No.	Country	Records	Percent	TLCS	TGCS
1	USA	301	25.8	2159	5935
2	UK	259	22.2	2926	7475
3	France	130	11.1	805	2134
4	South Africa	90	7.7	492	1272
5	Germany	79	6.8	573	1321
6	Spain	79	6.8	264	894
7	Belgium	67	5.7	560	1238
8	Australia	61	5.2	307	788
9	Netherlands	58	5.0	334	911
10	Unknown	55	4.7	308	795
11	Italy	49	4.2	278	696
12	India	47	4.0	113	280
13	Switzerland	35	3.0	248	517
14	Canada	34	2.9	128	314
15	Japan	21	1.8	65	

Table 10 Language-wise Distributions

Sl.No.	Language	Records	Percent	TLCS	TGCS
1	English	1099	94.2	6824	18315
2	German	28	2.4	72	119
3	French	21	1.8	15	68
4	Polish	6	0.5	0	2
5	Portuguese	4	0.3	1	6
6	Dutch	3	0.3	2	3
7	Spanish	3	0.3	3	24
8	Turkish	2	0.2	0	0
9	Italian	1	0.1	0	0

5. CONCLUSION

During the period (1989-2014) 1167 (100%) articles were published which are indexed in Web of Science. Overall, 3260 authors contributed 226 publications in the journal. The authorship pattern of Scientometric Mapping of Bluetongue diseases identified that majority of papers authored. This study has highlighted quantitatively the contributions made by the Scientometric Mapping of Bluetongue virus researchers during 1989-2014 as reflected in Web of Science database. During 26 years period (1989-2014) contributions in terms of number of publications is significant. WOS and VOS Viewers is useful for researchers, administrators, policy makers, editors, librarians and analysts for their respective nature of work.

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Scientometric Side Visualization of Solar Power Generation: The Global Perspective

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Abstract

An analysis of 3707 publications published by scientists on Solar Power Generation during 2005-2014 and indexed by Web of Science online Database indicates that the publication output in the Global level. The highest numbers of papers were published during the year 2014 with 874 records and the following year 2013 with 735 records. The least number of papers was recorded during 2005 with 91 records. Overall, 10643 authors contributed 662 publications in the journal and institutions-wise with 2580 records of the publications.

Keywords: *Solar power, Scientometrics, Web of science.*

1. INTRODUCTION

Amidst current ecological and energy constraints, solar energy is a viable option as an alternative fuel. But it has two major limitations-poor efficiency and higher initial costs.

Working on these lines, researchers from London have demonstrated a new technique to improve the efficiency of solar panels by augmenting its light-facing surface with aluminum nanostructures, which resulted in about 22% increase in production of electrical current. By studding the light-receiving surface of gallium-arsenide devices with aluminum nano - cyclinders, the researchers were able to promote the scattering of light in the visible part of sunlight's spectrum. Dr. Nicholas Hylton, lead author of the finding published in Scientific Reports published in 2013, said the advantages of using aluminum structures is that the absorption losses are limited to the ultraviolet part of the spectrum. Earlier, scientists had used silver and gold nanoparticles to enhance the performance of solar panels. However, Dr.Hylton's work demonstrated better performance of aluminum over silver and gold nanostructure. This is quite significant as aluminum is less costly and more abundant. This will make implementation of solar-panels in energy sector more cost-effective.

2. VOS VIEWER

VOSviewer is a software tool for constructing and visualizing bibliometric networks. These networks may for instance include journals, researchers, or individual publications, and they can be constructed based on co-citation, bibliographic coupling, or co-authorship relations. VOSviewer also offers text mining functionality that can be used to construct and visualize co-occurrence networks of important terms extracted from a body of scientific literature.

3. OBJECTIVES

The main objective of this study was to use Scientometric Mapping of Solar Power Generation with special reference to research activities at global level:

i To identify and analyze the rate of growth of research productivity;
ii To examine the Year wise distribution of publications;
iii To note the Document wise distribution of publications;
iv To analyze the authorship pattern and examine the extent of research collaboration
v To identify journal wise distribution of publications;
vi To assess the Institution wise research concentration;
vii To identify Country – wise Collaborative Distribution of Publications;
viii To identify the word wise distribution of publications.
ix To test the law of metrics.

4. METHODOLOGY

Sceintometric and Biobliometrics study is the examination of the frequency, patterns, chart, and graphs of citations in articles and books. This study is aimed to discuss the Side visualization of the Solar Power Generation with special reference to research activities at global level. The relevant sources and data are

collected from Web of Science. Based on the available sources the following discussions were made.

5. ANALYSIS AND INTERPRETATIONS

5.1 Year-wise Distribution of Publications

To analyze the year wise publication of research on Solar power Generation the data has been presented in Table 1. The table depicts the research output in the global level.

From the below table, we could clearly see that during the period 2005 – 2014 a total of 3707 publications were published. In the present study the research output on Solar Power Generation publication is taken as a tool to evaluate the performance at various levels.

Table 1Yearly Output of Distribution of the Publications

Sl.No.	Publication Year	Records	Percent	TLCS	TGCS	D	Variance	S.D	MEAN
1	2005	91	2.5	446	8180	-4			
2	2006	105	2.8	341	4219	-3			
3	2007	149	4.0	436	5566	-2			
4	2008	171	4.6	561	7800	-1			
5	2009	237	6.4	738	9647	0	**5.86**	**2.42**	**2011.45**
6	2010	336	9.1	980	10528	1			
7	2011	449	12.1	939	11171	2			
8	2012	560	15.1	576	9144	3			
9	2013	735	19.8	463	8038	4			
10	2014	874	23.6	125	4162	5			
	Total	**3707**	**100**			**5**			

*TLCS – Total Local Citation Score ** TGCS – Total Global Citation Score

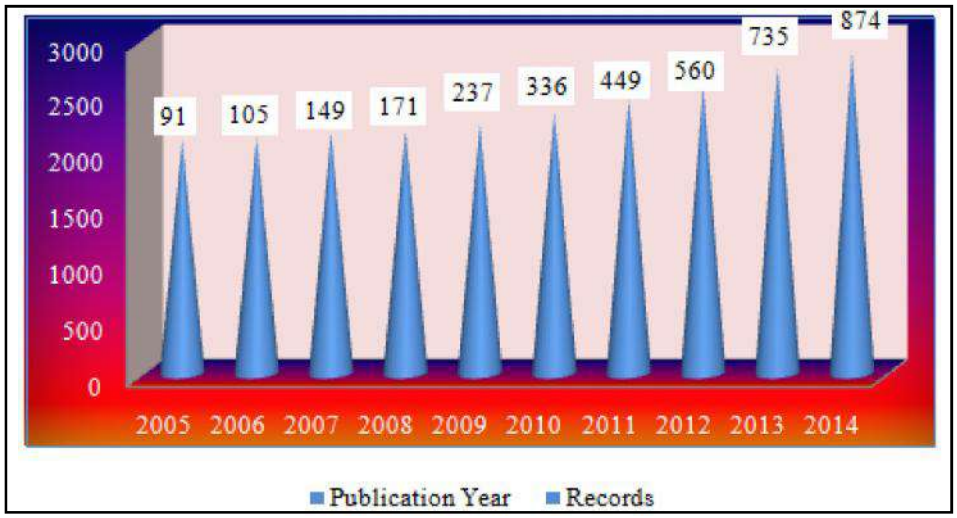


Fig.1Yearly Output of Distribution of the Publications

Table 2 clearly shows that during the period 2005-2014 a total of 3707 publications were published at global level. Table shows that the highest publication of doubling time as well as followed by 0.22 and 0.20 in the year of 2006, 2007 and 2008. Table also shows that the highest publication of exponential growth rate as 1.42 records in the year 2006 and 2009.

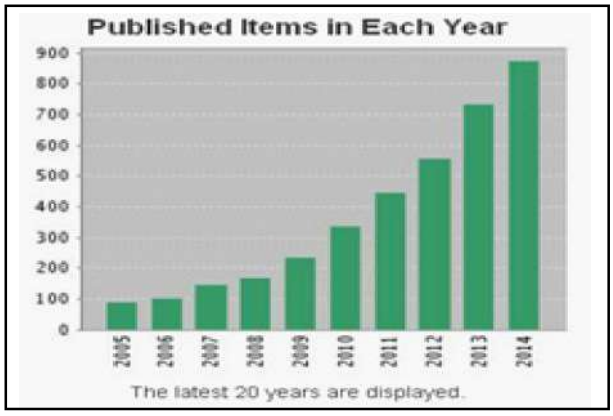
The Figure 2 shows that the Calculation of the h-index is based on a list of publications ranked in descending order by the Times Cited. The value of h is equal to the number of papers (N) in the list that have N or more citations. The calculated in the h-index as follows in the formula. An h-index of 112 means that this author has published at least 112 papers that have each received at least 112 citations.

Table 2 Exponential Growth Rate and Doubling Time in Number of Publication Was Observed During 2005 To 2014

Sl. No.	Publication Year	Records	Log W1	Log W2	R(a)	Dt.	Exponential Growth rate
1	2005	91	-	4.51	4.51	0.15	1.15
2	2006	105	1.54	4.65	3.12	0.22	1.42
3	2007	149	1.61	5.00	3.39	0.20	1.15
4	2008	171	1.64	5.14	3.50	0.20	1.39
5	2009	237	1.70	5.47	3.77	0.18	1.42
6	2010	336	1.76	5.82	4.06	0.17	1.34
7	2011	449	1.81	6.11	4.30	0.16	1.25
8	2012	560	1.84	6.33	4.48	0.15	1.31
9	2013	735	1.89	6.60	4.71	0.15	1.19
10	2014	874	1.91	6.77	4.86	0.14	0.00
	Total	**3707**	-	-	-	**40.70**	

Total No of Publications: 3707
Sum of the Times Cited: 79800
Times Cited without self-citations: 73709
Citing Articles: 50818
Average Citations per Item: 21.53

H-index: 112



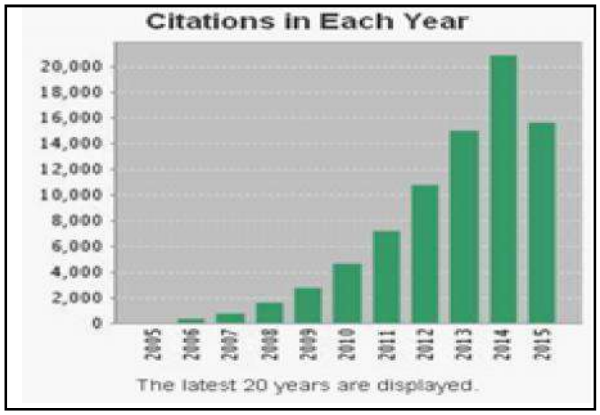


Fig.2 Published Items and Citations in Each Year

5.2 Author-wise Distributions of the Publications

Table 3 Top 15 author-wise distributions of publications during the study period 2005-2014 in the field of Solar Power Generation at Global level. The Total number of author publication in these records with 10643. The highest Productivity of publications goes to Dincer I with 21 (0.6%) records and followed by the Gangotri KM with 18 (0.5%) records. The least productivity of publications goes to Kamat PV, Kaushik SC, Kim H, Singh R and Steinfeld A with 11 (0.3%) records.

Table 3 Top 15 Author-wise Distributions of the Publications

Sl. No.	Author	Records	%	TLCS	TGCS
1	Dincer I	21	0.6	30	437
2	Gangotri KM	18	0.5	44	88
3	Gratzel M	13	0.4	39	2735
4	Janssen RAJ	13	0.4	36	813
5	Yang YP	13	0.4	67	109
6	Jin HG	12	0.3	7	29
7	Muttaqi KM	12	0.3	5	72
8	Sharma GD	12	0.3	7	331
9	Yang HX	12	0.3	165	695
10	Zhao L	12	0.3	54	236
11	Kamat PV	11	0.3	48	1476
12	Kaushik SC	11	0.3	47	123
13	Kim H	11	0.3	3	63
14	Singh R	11	0.3	19	106
15	Steinfeld A	11	0.3	12	218

***TLCS – Total Local Citation Score ** TGCS – Total Global Citation Score**

Figure 3 shows that the co-authorship with authors as well as the 103 items of the authors is recording to the 13 clusters follows. The first and second clusters including in the 12 items, third and fourth clusters share in the documents 10 items, fifth and sixth clusters 10 items, seven, eight and ninth clusters shares 7 items, tenth cluster 5 items, eleven, twelve and thirteen clusters also only three items of author's wise publication of the records. Differentiated by difference colors of the clusters. Analyzing co-authorship with co-citation of the information on a larger database of scientific publications will assist in identifying groups of people who work closely together.

Table 4 shows that the highest number of the publications on 876 records in three author product and least product on nine and more than ten author productivity on 67 and less than 5 records of the publications.

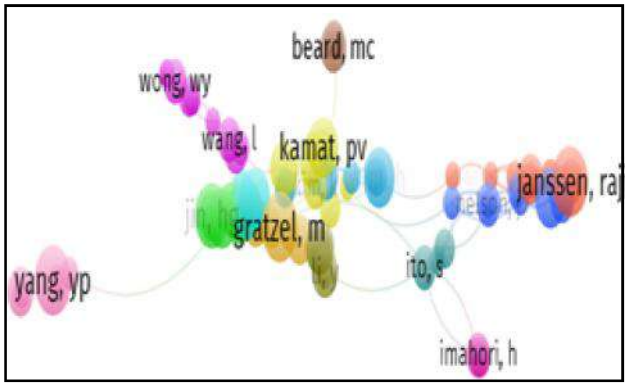


Fig.3 Co-Authorship with Authors

Figure 4 shows that the Bibliographic coupling with authorship relations among authors allows for the representation of information in many ways, which make relationships among them easy to understand. Figure shows a co-occurrence network map generated from publications of the authors. Several different components including author nodes (circles), co-occurrence weight (circle size), networked relationship clustering (color and proximity), and name of authors (text) are included in a map. The paper co-authorship network is a network expressing existence of co-authorship relation between authors of scientific papers (Dincer I and Gangotri Km). In the circle's color indicates the cluster or group which the authors are associated. Clustering shows the dimension of similarity to other authors in the display. The co-authorship relations are relations representing whether an author have written a paper with another author, typically a paper is written by two or more authors. Analyzing co-authorship information on a larger database of scientific publications will assist in identifying groups of people who work closely together (Dincer I and Gangotri KM).

Table 4 Author Wise Distributions of the Publications

Year	One	Two	Three	Four	Five	Six	Seven	Eight	Nine	>10	Total
2005	11 (0.30)	19 (0.51)	23 (0.62)	15 (0.40)	12 (0.32)	03 (0.08)	03 (0.08)	01 (0.03)	-	4 (0.11)	91 (2.45
2006	13 (0.35)	31 (0.84)	25 (0.67)	14 (0.38)	10 (0.27)	08 (0.22)	01 (0.03)	-	-	3 (0.08)	105 (2.83)
2007	18 (0.49)	49 (1.32)	36 (0.97)	20 (0.54)	10 (0.27)	06 (0.16)	04 (0.11)	02 (0.05)	03 (0.08)	1 (0.03)	149 (4.02)
2008	22 (0.59)	34 (0.92)	36 (0.97)	31 (0.84)	15 (0.40)	12 (0.32)	10 (0.27)	06 (0.16)	02 (0.05	3 (0.08)	171 (4.61)
2009	30 (0.81)	54 (1.46)	51 (1.38)	41 (1.11)	24 (0.65)	21 (0.57)	04 (0.11)	04 (0.11)	02 (0.05)	6 (0.16)	237 (6.39)
2010	30 (0.81)	80 (2.16)	79 (2.13)	56 (1.51)	36 (0.97)	24 (0.65)	14 (0.38)	07 (0.19)	03 (0.08)	7 (0.19)	336 (9.06)
2011	54 (1.46)	87 (2.35)	100 (2.7)	74 (2.00)	41 (1.11)	35 (0.94)	18 (0.49)	15 (0.40)	08 (0.22)	17 (0.46)	449 (12.11)
2012	37 (1.00)	112 (3.02)	136 (3.67)	87 (2.35)	78 (2.1)	39 (1.05)	23 (0.62)	16 (0.43)	10 (0.27)	22 (0.59)	560 (15.11)
2013	62 (1.67)	138 (3.72)	183 (3.72)	137 (3.7)	67 (1.81)	60 (1.62)	30 (0.81)	20 (0.54)	15 (0.40)	23 (0.62)	735 (19.83)
2014	55 (1.48)	139 (3.75)	207 (3.75)	186 (5.02)	110 (2.97)	55 (1.48)	40 (1.08)	22 (0.59)	24 (0.65)	36 (0.97)	874 (23.58)
	332 (8.96)	**743 (20.04)**	**876 (23.63)**	**661 (17.83)**	**403 (10.87)**	**263 (7.09)**	**147 (3.97)**	**93 (2.51)**	**67 (1.81)**	**122 (3.29)**	**3707 (100)**

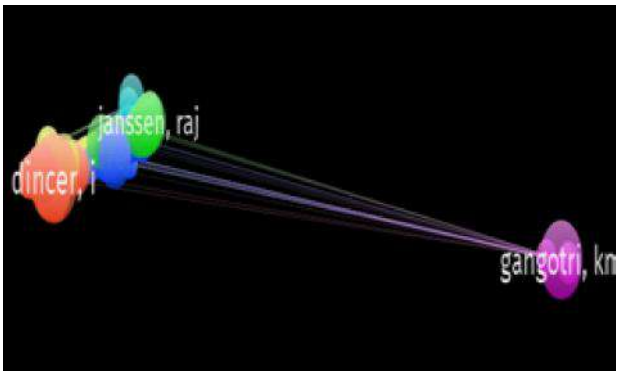


Fig.4 Co-Authorship with Single Authors

Table 5 shows that the number of authors compared with the Chi-Square test on author productivity by Lotka's law. So the total observed number of authors with 10643 records and the Chi-Square test is 65361.32 records.

Figure 5 shows the collaboration network analysis between Document wise distributions of publications of 3496 records has been investigated. That is, the color of a point in a map depends on the 3496 documents is divided by the 18 clusters. The first Cluster share or divided in the 1483 items, second cluster share 625 items, third cluster have 400items, fourth cluster have 367 items, fifth cluster have 315 items, sixth cluster have 169 items, cluster seventh have 57 items, cluster eighth have 38 items, cluster nine, ten, eleven, twelve, thirteen, fourteen, fifteen, sixteen, seventeen, and eighteen as follow the 9, 7, 4, 3, 2, 2, 2, 1, 1 and 1 items of the source of documents. The 18 Clusters difference between the 18 colors.

Table 5 Productivity of Author Based on Lotka's Law

No. of Authors	Observed Number of Authors with 'n' or (an) or (f)	Observed Percentage of Authors 100 x an / a1	Expected Number of Authors (an=an/n^2)or(p)	(F-P)^2/P
1	332	100.00	332.00	0.00
2	743	223.80	185.75	1671.75
3	876	263.86	97.33	6229.33
4	661	199.10	41.31	9295.31
5	403	121.39	16.12	9285.12
6	263	79.22	7.31	8949.31
7	147	44.28	3.00	6912.00
8	93	28.01	1.45	5767.45
9	67	20.18	0.83	5293.83
10+	122	36.75	1.22	11957.22
Total	**3707**			**65361.32**

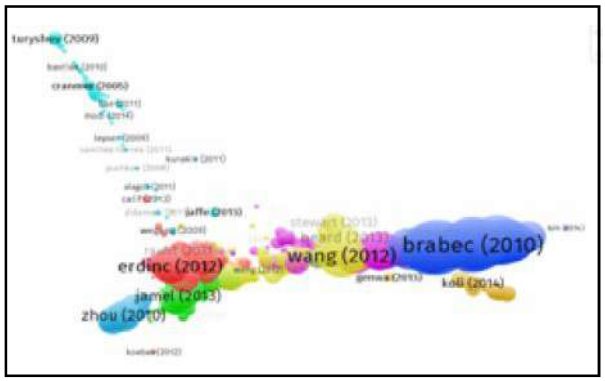


Fig.5 Document-wise Distributions of Publications

5.3 Journal-wise Distributions of the Publications

Table 6 shows that the study found that the total research output of the solar power Generation for the study period (2005-2014) published in 662 journals. As the major portion of the Renewable & Sustainable Energy Reviews 255 journals that are coincide with the first ranking of journals according to the theory of Bradford's Law of scattering of journals in research productivity.

Table 6 Top 15 Ranking of Journals According to Bradford's Distribution

Sl.No.	Journal	Records	Rank	Percent	TLCS	TGCS
1	Renewable & Sustainable Energy Reviews	255	1	6.9	834	5647
2	Solar Energy	183	2	4.9	598	3301
3	Renewable Energy	150	3	4.0	403	2052
4	Energy	132	4	3.6	284	2202
5	Energy Policy	120	5	3.2	332	2029
6	Applied Energy	115	6	3.1	278	1573
7	Energy Conversion and Management	111	7	3.0	177	1311
8	International Journal of Hydrogen Energy	85	8	2.3	138	1433
9	Solar Energy Materials and Solar Cells	81	9	2.2	96	1550
10	Journal of Solar Energy Engineering-Transactions of the ASME	68	10	1.8	48	334
11	Energy & Environmental Science	52	11	1.4	84	2622
12	Applied Thermal Engineering	46	12	1.2	94	484
13	Acs Applied Materials & Interfaces	40	13	1.1	32	613
14	Journal of Physical Chemistry C	40	13	1.1	45	1112
15	Applied Physics Letters	38	14	1.0	0	1203

*TLCS – Total Local Citation Score ** TGCS – Total Global Citation Score

5.4 Document-wise Distributions of the Publications

Table 7 Document-wise Distributions of the Publications

Sl.No.	Document Type	Records	Percent	TLCS	TGCS
1	Article	3084	83.2	3973	56560
2	Review	402	10.8	1211	17511
3	Article; Proceedings Paper	199	5.4	414	3926
4	Editorial Material	8	0.2	2	15
5	Review; Book Chapter	4	0.1	1	367
6	Article; Book Chapter	2	0.1	2	62
7	Correction	2	0.1	0	0
8	Letter	2	0.1	2	14
9	Meeting Abstract	2	0.1	0	0
10	News Item	2	0.1	0	0

*TLCS – Total Local Citation Score ** TGCS – Total Global Citation Score

5.5 Words-wise Distributions of the Publications

Table 8 shows that Ranking of words according to Zif Law's Distribution. The total word of the publication is 5201 records. Among this the word "SOLAR" with 1640 records with first rank of the frequency and TGCS with 41782 records. The next word follows as "POWER" with 952 records with second rank of the frequency and TGCS 12729 records as well as follows the publications.

5.6 Language-wise Distributions of the Publications

Table 9 shows that the language wise distribution of the publications is only share in the 8 languages. Among this the language "English" with 3673 records and TGCS with 78397 records. The next language follows as "Chinese" with 28 records and TGCS 38 records as well as follows the publications.

Table 8 Top 20 Ranking of Words according To Zif Law's Distribution

Sl.No.	Word	Records	Percent	Rank	K	TLCS	TGCS
1	SOLAR	1640	44.2	1	1640	3430	41782
2	POWER	952	25.7	2	1904	2026	12729
3	ENERGY	825	22.3	3	2475	1424	13680
4	GENERATION	629	17.0	4	2516	1403	10526
5	PHOTOVOLTAIC	533	14.4	5	2665	791	9979
6	SYSTEM	500	13.5	6	3000	963	6882
7	CELLS	474	12.8	7	3318	810	23908
8	ANALYSIS	317	8.6	8	2536	674	3971
9	BASED	315	8.5	9	2835	436	6398
10	SYSTEMS	306	8.3	10	3060	801	5713
11	HYBRID	293	7.9	11	3223	795	5676
12	USING	286	7.7	12	3432	519	5570
13	RENEWABLE	280	7.6	13	3640	437	4509
14	THERMAL	262	7.1	14	3668	594	3379
15	PERFORMANCE	261	7.0	15	3915	410	4291

*TLCS – Total Local Citation Score ** TGCS – Total Global Citation Score

Table 9 Language-wise Distributions of the Publications

Sl.No.	Language	Records	%	Cumulative Percent	TLCS	TGCS
1	English	3673	99.1	99.1	5603	78397
2	Chinese	13	0.4	99.5	1	38
3	German	9	0.2	99.7	1	7
4	Polish	5	0.1	99.8	0	1
5	Portuguese	3	0.1	99.9	0	8
6	Spanish	2	0.1	100	0	3
7	Croatian	1	0.0	100	0	1
8	Japanese	1	0.0	100	0	0

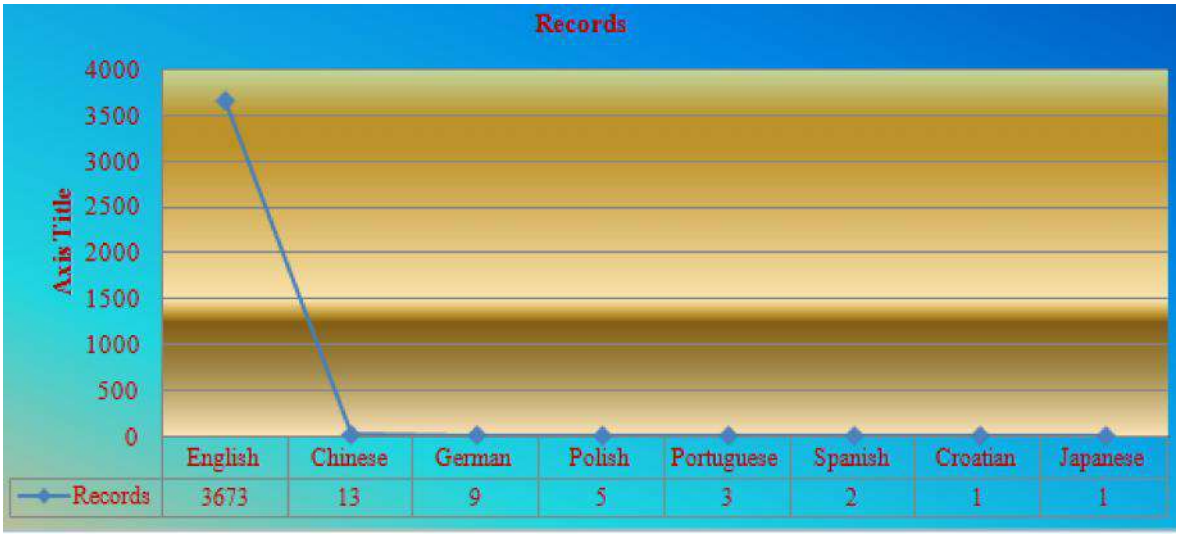


Fig.6 Language-wise Distributions of the Publications

5.7 Institution-wise Distributions of the Publications

In a view of institutions, about 2580 institutions wise publication of the journal articles. But the first Chinese Academic Science published 108 papers and National Renewable Energy Lab (51), Indian Institution Technology (44) and MIT (41) published as well as follow the papers. Many of institutes are collaborating with each other for a research on stent. High quality and high international network where almost the whole top-15 institutions are belonging.

Table 10 Top 15 Institution-wise Distributions of the Publications

Sl.No.	Institution	Records	Percent	TLCS	TGCS
1	Chinese Academic Science	108	2.9	125	2467
2	National Renewable Energy Lab	51	1.4	172	2730
3	Indian Institute Technologies(IITs)	44	1.2	105	798
4	MIT	41	1.1	71	1334
5	University California Berkeley	38	1.0	39	2177
6	University Cambridge	37	1.0	51	1576
7	Stanford University	35	0.9	74	1349
8	Jai Narain Vyas University	33	0.9	65	427
9	National Taiwan University	32	0.9	33	652
10	University Malaya	30	0.8	79	674
11	University London Imperial College Science Technology & Medicine	29	0.8	60	895
12	Unknown	28	0.8	12	133
13	Huazhong University Science & Technology	27	0.7	96	483
14	Georgia Institution Technology	26	0.7	39	1346
15	Russian Academic Science	26	0.7	2	168

*TLCS-Total Local Citation Score ** TGCS-Total Global Citation Score

Figure 7 shows the collaboration network analysis between Institution wise distributions of publications of 2580 records has been investigated. That is, the color of a point in a map depends on the 322 items shares are divided by the 6 clusters. The first Cluster share or divided into 173 items, second cluster share 67 items and third cluster have 55 items as well as follows.

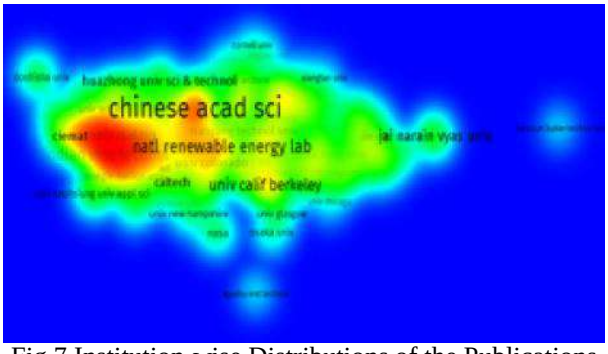


Fig.7 Institution-wise Distributions of the Publications

5.8 Country-wise Distribution of the Publications

Top 15 Shows that the country wise distribution of the publications with 97 records. Among this country " USA" with 834 records, "Peoples R China" with 510 records, and India with 267 records as well as follows in the distribution of the publications.

Table 11 Top 15 Country-wise Distribution of the Publications

Sl.No.	Country	Records	Percent	TLCS	TGCS
1	USA	834	22.5	1228	28285
2	Peoples R China	510	13.8	839	8843
3	India	267	7.2	464	3327
4	Germany	241	6.5	372	6037
5	Spain	226	6.1	378	3913
6	UK	226	6.1	311	7017
7	Japan	212	5.7	335	3623
8	Australia	165	4.5	249	2409
9	South Korea	144	3.9	97	3091
10	Taiwan	142	3.8	113	2190
11	Canada	139	3.7	199	2767
12	Italy	134	3.6	112	2279
13	Unknown	93	2.5	190	1859
14	Turkey	92	2.5	143	944
15	Malaysia	80	2.2	146	1230

6. FINDING AND CONCLUSION

During the period (2005-2014) 3707 (100%) articles were published which are indexed in Web of Science. Overall, 10623 authors contributed 662 publications in the journal. The authorship pattern of Scientometric Side visualization of Solar power Generation: The Global Perspective identified that majority of papers authored. This study has highlighted quantitatively the contributions made by the Scientometric Side visualization of Solar Power Generation: The Global Perspective researchers during 2005-2014 as reflected in Web of Science database. During 10 years period (2005-2014) contributions in terms of number of publications is significant. WOS is useful for researchers, administrators, policy makers, editors, librarians and analysts for their respective nature of work.

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Scientometric Mapping of Green Revolution: The Global Perspective

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Abstract

An analysis of 1165 publications published by scientists on Green Revolutions during 2005-2014 and indexed by Web of Science online Database indicates that the publication output in the Global Research Publication. The highest numbers of papers were published during the year 2014 with 175 records and the following year 2012 with 168 records there were contributions. The least number of papers was recorded during 2005 with 61 records. Overall, 3760 authors contributed 559 publications in the journal and cited reference with 46219 records of the articles.

Keywords: *Green revolution, Global research*

1. INTRODUCTION

The Green Revolution refers to a series of research, and development, and technology transfer initiatives, occurring between the 1940s and the late 1960s that increased agricultural production worldwide, particularly in the developing world beginning most markedly in the late 1960s. The initiatives, led by Norman Borlaug, the "Father of the Green Revolution" credited with saving over a billion people from starvation, involved the development of high-yielding varieties of cereal grains, expansion of irrigation infrastructure, modernization of management techniques, distribution of hybridized seeds, synthetic fertilizers, and pesticides to farmers.

The term "Green Revolution" was first used in 1968 by former United States Agency for International Development (USAID) director William Gaud, who noted the spread of the new technologies: "These and other developments in the field of agriculture contain the makings of a new revolution. It is not a violent Red Revolution like that of the Soviets, nor is it a White Revolution like that of the Shah of Iran. I call it the Green Revolution."

This study reveals the nature of research publications in the field of Green Revolutions. Scientometric output reach activities in country wise through the study are estimated. Now days, research depicts much interest in publishing the articles in the field of Science. Green Revolution is a multidisciplinary subject that employs and develops theories and methods for the investigation of Science systems. This analysis helps to identify the key issues affecting the research field. Scientometric techniques are employed to analyze the publications Green Revolution to identify the nature and the significance of publications.

2. OBJECTIVES

The main objective of this study was to use Scientometric Mapping of Green Revolution with special reference to research activities at global level:

i To identify and analyze the rate of growth of research productivity;
ii To examine the Year wise distribution of publications;
iii To note the Document wise distribution of publications;
iv To analyze the authorship pattern and examine the extent of research collaboration
v To identify journal wise distribution of publications;
vi To assess the Institution wise research concentration;
vii To identify Country – wise Collaborative Distribution of Publications;
viii To identify the word wise distribution of publications.
ix To test the law of metrics.

3. METHODOLOGY

Sceintometric and Biobliometrics study is the examination of the frequency, patterns, chart, and graphs of citations in articles and books. This study is aimed to discuss the mapping of the Green Revolution with special reference to research activities at global level. The relevant sources and data are collected from Web of Science. Based on the available sources the following discussions were made.

4. PRINCIPAL BENEFICIARIES OF THE GREEN REVOLUTION

I. WHEAT
i Mexico
ii Egypt
iii Turkey
II RICE
i Thailand
ii Vietnam
iii Korea
iv Indonesia
III BOTH
i India
ii China and Pakistan

5. BIO REVOLUTION COMPARED WITH GREEN REVOLUTION

TABLE 8.1 Biorevolution Compared with Green Revolution

Characteristics	Green Revolution	Biorevolution
Crops affected	Wheat, rice, maize	Potentially all crops, including vegetables, fruits, agro-export crops, and specialty crops
Other sectors affected	None	Pesticides, animal products, pharmaceuticals, processed food products energy, mining, warfare
Territories affected	Some developing countries	All areas, all nations, all locations, including marginal lands
Development of technology and dissemination	Largely public or quasi-public sector, international agricultural research centers (IARCs), R&D millions of dollars	Largely private sector, especially corporations, R&D billions of dollars
Proprietary considerations	Plant breeders' rights and patents generally not relevant	Genes, cells, plants, and animals patentable as well as techniques used to produce them
Capital costs of research	Relatively low	Relatively high for some techniques, relatively low for others
Access to information	Restricted due to privatization and proprietary considerations	Relatively easy, due to public policy of IARCs
Research skills required	Conventional plant breeding and parallel agricultural sciences	Molecular and cell biology expertise as well as conventional plant-breeding skills
Crop vulnerability	High-yielding varieties relatively uniform; high vulnerability	Tissue culture crop propagation produces exact genetic copies; even more vulnerability
Side effects	Increased monoculture and use of farm chemicals, marginalization of small farmer, ecological degradation. Increased foreign debt due to decrease in biomass fuels and the increasing reliance on costly, usually imported petroleum	Crop substitution replacing Third World exports; herbicide tolerance; increasing use of chemicals; engineered organisms might affect environment; further marginalization of small farmer

6. ANALYSIS AND INTERPRETATIONS

6.1 Author-wise Distributions

Table 1 Shows that the Top 15 author wise distributions of publications during the study period 2005-2014 in the field of Green Revolution at Global level. The Total number of author publication in these records with 3760. The highest Productivity of publications goes to Matsuoka M with 21 (1.8%) records and followed by the Kitano H with 18 (1.5%) records. The least productivity of publications goes to Hedden P and Boulton MI with 6 (0.5%) records.

6.2 Journal-wise Distributions

Table 2 shows that the Top 15 Journal wise Distributions of publications in this highest journal of PLOS ONE with 25 records and the followed by Agricultural Economics, Proceedings of the National Academy of Sciences of the United States of America and Theoretical and Applied Genetics with 21 records of each and rest as the journal was least records.

Table 1 Top 15 Author-wise Distributions

Sl.No.	Author	Records	TLCS	TGCS	(%)
1	Matsuoka M	21	193	1215	1.8
2	Kitano H	18	181	1045	1.5
3	Otsuka K	16	38	124	1.4
4	Ashikari M	15	167	978	1.3
5	Yano M	9	28	238	0.8
6	Matsumoto T	8	20	92	0.7
7	Rahman S	8	6	31	0.7
8	[Anonymous]	8	0	0	0.7
9	Asano K	7	60	193	0.6
10	Erenstein O	7	3	37	0.6
11	Jia JZ	7	19	30	0.6
12	Qian Q	7	89	748	0.6
13	Wakatsuki T	7	2	8	0.6
14	Boulton MI	6	37	77	0.5
15	Hedden P	6	36	120	0.5

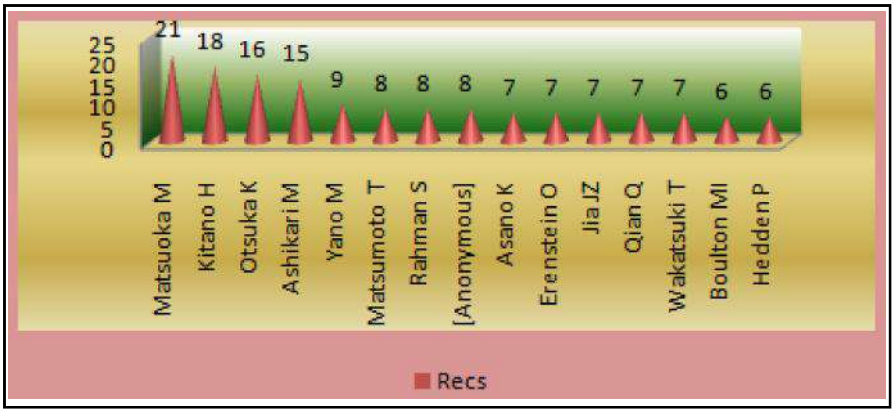

Fig.1 Top 15 Author-wise Distributions

Table 2: Top 15 Ranking of Journals According to Bradford's Distribution

Sl. No.	Journal	Records	R	%	TLCS	TGCS	TGCS
1	Plos one	25	1	4.47	0	134	71
2	Agricultural Economics	21	2	3.76	28	186	22
3	Proceedings of the National Academy of Sciences of the United States of America	21	2	3.76	75	1532	19
4	Theoretical And Applied Genetics	21	2	3.76	35	389	53
5	Plant Physiology	19	3	3.40	64	289	34
6	Molecular Breeding	18	4	3.22	15	84	33
7	Euphytica	17	5	3.04	20	267	14
8	Journal of Experimental Botany	16	6	2.86	40	276	27
9	Field Crops Research	13	7	2.33	7	121	15
10	Crop Science	12	8	2.15	11	89	12
11	Food Policy	12	8	2.15	8	131	15
12	Agricultural Systems	11	9	1.97	8	145	11
13	Journal Of Development Studies	11	9	1.97	12	60	10
14	Plant Science	11	9	1.97	4	145	8
15	Food Security	9	10	1.61	14	87	10

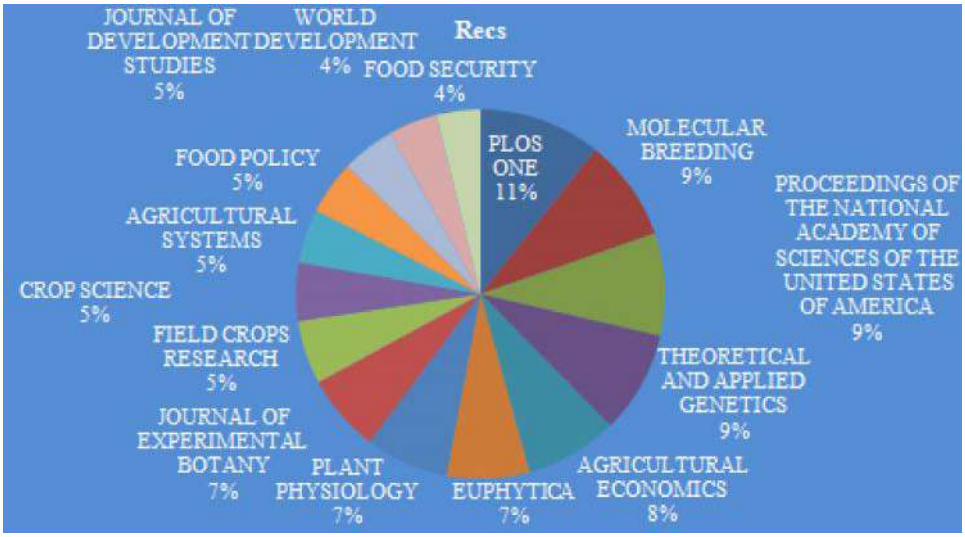

Fig.2 Top 15 Journal-wise Distributions

6.3 Words-wise Distributions

Table 3 shows those Top 15 Words wise Distributions in the highest publication of words Green and Revolution with 244 and 239 records. The Least publications of words Crop with 44 records.

Table 3 Top 15 Words-wise Distributions

Sl.No.	Word	Records	TLCS	TGCS
1	Green	244	281	1803
2	Revolution	239	301	1979
3	Rice	184	280	1841
4	Wheat	95	151	1278
5	Plant	78	87	655
6	Agricultural	73	31	313
7	Gene	64	132	522
8	Food	62	53	1010
9	Africa	55	70	384
10	Development	55	37	500
11	India	53	25	220
12	Agriculture	50	29	793
13	Analysis	49	50	370
14	Genetic	49	49	535
15	Crop	44	35	883

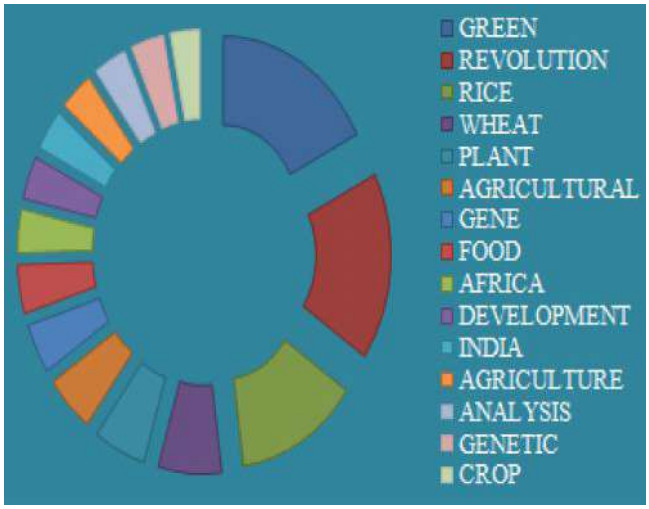

Fig.3 Top 15 Words-wise Distributions

6.4 Yearly-wise Distributions

Table 4 Shows that Yearly wise distributions during the year 2006-2014. The highest publication of records with 175 in the year2014 and least records of publication with 61 in the year 2005. The calculation with the variance and Standard Variations in 134463.9 and 366.69.

The Table 5 reveals the Exponential Growth rate of over all publications on Green Revolution during ten years. An exponential growth rate in number of publication was observed during 2005 to 2014. The highest growth rate (1.48 %) was found during 2009 with 88 publications followed by (1.39 %) with 62 publications during 2006 and least growth rate (0%) was found during 2014 with 175 publications followed by (0.9%) was found during 2008 with 98 publications.

Table 4 Yearly-wise Distributions

Sl.No.	Publication Year	Records	TLCS	TGCS	D	D^2/n	Variance	S.D (σ)
1	2005	61	153	1665	-244	59536		
2	2006	62	175	1562	-186	34596		
3	2007	86	163	1689	-172	29584		
4	2008	98	94	1749	-98	9604		
5	2009	88	107	1598	0	0		
6	2010	130	95	1685	130	16900		
7	2011	141	137	1547	282	79524		
8	2012	168	85	1064	504	254016		
9	2013	156	47	531	624	389376	134463.9	366.69
10	2014	175	8	121	875	765625		
	Total	**1165**			**1715**	**1638761**		

Table 5 Exponential Growth Rate in Number of Publication Was Observed During 2005 to 2014

Sl.No.	Publication Year	Records	Growth Rate
1	2005	61	1.02
2	2006	62	1.39
3	2007	86	1.14
4	2008	98	0.9
5	2009	88	1.48
6	2010	130	1.09
7	2011	141	1.19
8	2012	168	0.93
9	2013	156	1.12
10	2014	175	0
	Total	**1165**	10.24

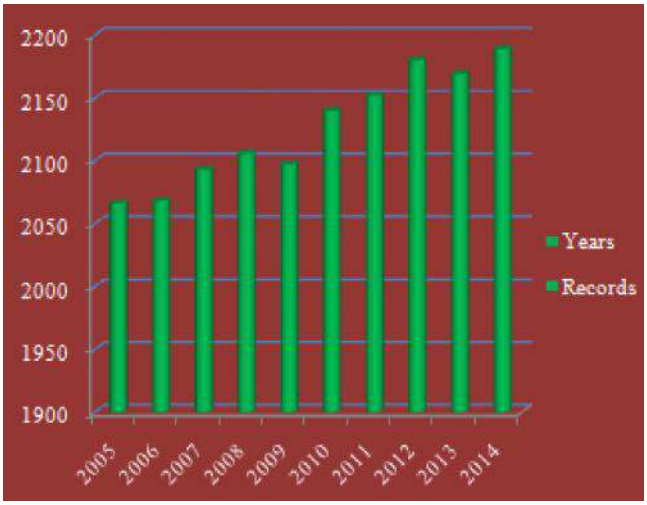

Fig.4 Yearly-wise Distributions of Publications

6.5 Document-wise Distribution of Publications

Table 6 shows that the major portions of publications covered by Web of Science databases on Green Revolutions results in Article with 835 (74.16%) and followed by the Review 128 (11.37%). The minor portions of publications covered by web of science on green revolutions results in Biographical-Item and Reprint with 2 (0.18%).

Table 6 Document-wise Distributions

Sl.No.	Document Type	Records	TLCS	TGCS	Perc(%)	Cum.Perc(%)
1	Article	856	818	9547	73.5	73.5
2	Review	132	139	3435	11.3	84.8
3	Editorial Material	58	32	351	5.0	89.8
4	Book Review	44	0	1	3.8	93.6
5	Article; Proceedings Paper	39	28	604	3.3	96.9
6	Review; Book Chapter	8	6	171	0.7	97.6
7	Article; Book Chapter	6	3	104	0.5	98.1
8	Letter	6	2	13	0.5	98.6
9	Meeting Abstract	6	0	0	0.5	99.1
10	News Item	6	0	0	0.5	99.6
11	Biographical-Item	2	1	1	0.2	99.8
12	Reprint	2	0	0	0.2	100
	Total	**1165**			**100**	

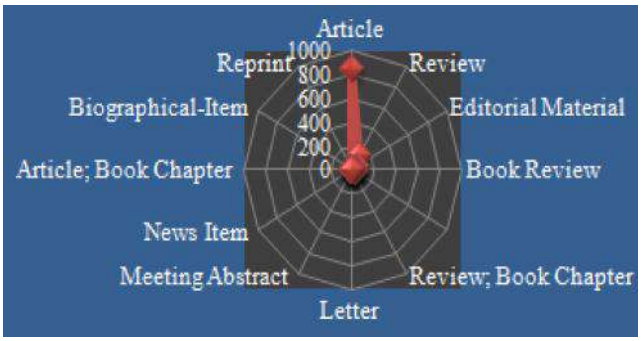

Fig.5 Document-wise Distributions

*TLCS-Total Local Citation Scores
**TGCS – Total Global Citation Scores

6.6 Language-wise Distributions

Table 7 Shows that language wise distribution, among the languages English language ranks first with 1101 records and followed by the French and Spanish language with 9 records each.

Table 7 Language-wise Distributions

Sl.No.	Language	Records	TLCS	TGCS
1	English	1139	1029	14207
2	French	9	0	3
3	Spanish	9	0	4
4	German	3	0	4
5	Portuguese	3	0	5
6	Chinese	1	0	4
7	Czech	1	0	0

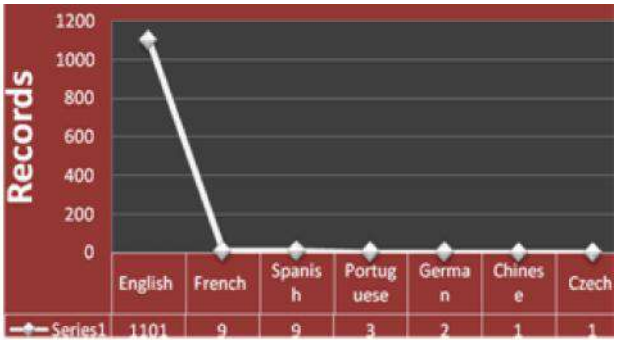

Fig.6 Language-wise Distributions

6.7 Country-wise Distributions

Table 8 shows that the country wise distributions among the USA with 317records and the followed by the People R China 155with records as well as follows.

Table 8 Country-wise Distributions

Sl.No.	Country	Records	TLCS	TGCS
1	USA	320	247	4964
2	Peoples R China	155	173	2061
3	UK	136	138	2010
4	Unknown	120	111	1076
5	Japan	102	261	1992
6	India	97	38	757
7	Australia	59	83	855
8	Germany	46	24	734
9	France	42	21	859
10	Canada	39	12	563
11	Netherlands	31	20	591
12	Italy	30	14	346
13	Philippines	30	17	305
14	Mexico	21	30	432
15	Spain	20	3	136

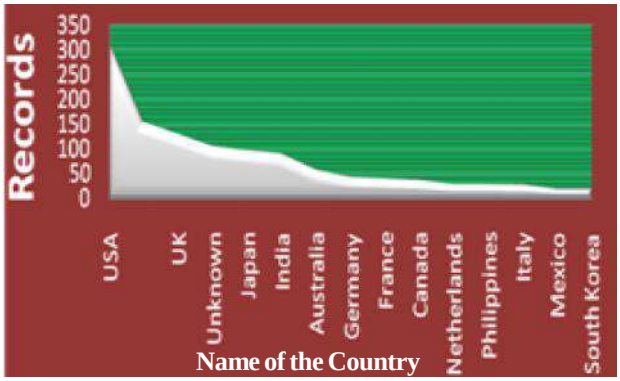

Fig.7 Country-wise Distributions

6.8 Institution-wise Distributions

Table 9 shows that institution wise distribution among the Chinese Academic Science with 41 records and the followed by Chinese Academic Agricultural Science with 32 records as well as follows.

Table 9 Top 15 Institution-wise Distributions

Sl.No.	Institution	Recs	TLCS	TGCS
1	Unknown	50	9	75
2	Chinese Acad Sci	44	80	743
3	Chinese Acad Agr Sci	32	53	658
4	Nagoya Univ	26	196	1248
5	Int Rice Res Inst	24	19	434
6	Cornell Univ	22	11	431
7	China Agr Univ	21	19	297
8	Natl Inst Agrobiol Sci	19	72	496
9	Huazhong Agr Univ	17	15	219
10	Wageningen Univ	16	14	420
11	CIMMYT	15	35	345
12	USDA ARS	15	10	283
13	Michigan State Univ	14	18	316
14	Int Food Policy Res Inst	13	22	112
15	Rothamsted Res	13	41	275

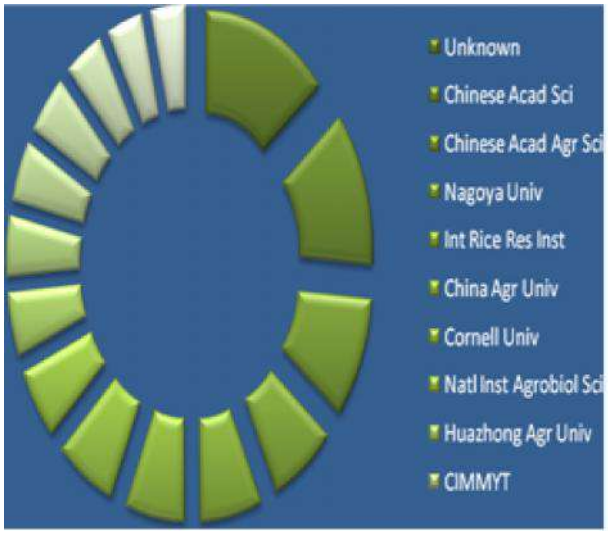

Fig.8 Institution-wise Distributions

7. FINDING AND CONCLUSION

During the period (2005-2014) 1126 articles were published which are indexed in Web of Science. Overall, 3760 authors contributed 559 publications in the journal. The authorship pattern of Scientometric Mapping of Green Revolution: The Global Perspective identified that majority of papers authored. This study has highlighted quantitatively the contributions made by the Scientometric Mapping of Green Revolution: The Global Perspective researchers during 2005-2014 as reflected in Web of Science database. During 10 years period (2005-2014) contributions in terms of number of publications is significant. WOS is useful for researchers, administrators, policy makers, editors, librarians and analysts for their respective nature of work.

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Bannari Amman Institute of Technology, (Sathyamangalam) Learning Centre : A Hi-tech Library

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Abstract

This article describes the salient features of a modern, world class hi-tech Learning Centre, Bannari Amman Institue of Technology, Sathyamangalam. An average of 4000 walk-ins reported on each working day. A centrally-air conditioned, five storeyed new Learning Centre built in an area of 8240M² on par with international standards. The fully automated Learning Centre provides an ambience conducive for teaching and learning process with support of 77210 volumes of text and reference books with RFID based Library Management System. Some of the best practices adopted are also listed.

1. INTRODUCTION

"Libraries store the energy that fuels imagination. They open up windows to the world and inspire us to explore and achieve, and contribute to improving our quality of life" – Sidney Sheldon.

The Learning Centre of the Institute stands as an epitome of intellectual elegance and a repository of technical education, in particular, engineering and technology. This Learning Centre plays a pivotal tole in the process of promoting and demonstrating desire for information, knowledge, and understanding among the students, and so aiding them in the development of their professional, personal, and spiritual lives. The Learning Centre inspires and supports students, faculty, researchers, and staff in all facets of their pursuits to dream, learn, create, and share knowledge and provide access to a wide array of technical ideas and information. Relying on its highly skilled staff, the Learning Centre encourages innovation, capitalizes on appropriate technologies, forges effective partnerships, and unequivocally promotes excellence among the vibrant generation.

Five storied, air-conditioned and fully automated new Learning Centre (8240 sq.m / 88,662 sq.ft.) provides the teaching and learning support with 77210 volumes of text and reference books facilitated by RFID based Library Management System. Besides, Learning Centre subscribes 400 National and International Journals and 6184 e-journals that includes IEL (IEEE), Elsevier Science Direct, Nature Publishing, ASCE, ASME, ASTM, ProQuest(Management), J-Gate, Springer, MCGRAW- HILL Access Engineering publications. An exclusive Digital Library houses 96 Chrome PCs for accessing on-line journals, NPTEL, NITTTR and other Open Source courseware.

2. INFRASTRUCTURE

- A centrally air – conditioned, five storied new Learning Centre has been built in an area of 88662 sq.ft on par with international standards with a view to cater to the prerequisites of pedagogy in an exemplary manner.
- The fully automated Learning Centre provides an ambience conducive for the teaching and learning process caters to over 6000 students and 480 faculty with 77210 volumes of text and reference books with RFID based Library Management System.

2.1 Floor Plan

LEVEL	SECTIONS
I LEVEL (GROUND FLOOR)	INFORMATION COUNTER, LIBRARIAN'S CABIN, PROPERTY DEPOSIT COUNTER, SELF-STUDY HALL, PERIODICALS SECTION, TECHNICAL SECTION, SELF-ISSUE / RETURN KIOSKS & CONTROL ROOM FOR CCTV SURVEILLANCE
II LEVEL (FIRST FLOOR)	DIGITAL LIBRARY REFERENCE SECTION REPROGRAPHIC CENTER, CONFERENCE HALL & DISCUSSION ROOMS
III LEVEL (SECOND FLOOR)	BOOK STACK & READING AREA (COMPUTER SCIENCE, MANAGEMENT STUDIES , SCIENCE & HUMANITIES) CONFERENCE HALL, DISCUSSION ROOMS
IV LEVEL (THIRD FLOOR)	BOOK STACK & READING AREA (CIVIL, MECHANICAL, AERONAUTICAL, AUTOMOBILE, ELECTRICAL, ELECTRONICS, INSTRUMENTATION, TEXTILE,FASHION & BIOTECHNOLOGY) VIP LOUNGE, DISCUSSION ROOMS
V LEVEL (FOURTH FLOOR)	READING AREA

2.2 Entrance of the Learning Centre

i. The Learning Centre of our Institute stands as an epitome of intellectual elegance and as a repository of knowledge.
ii. It inspires and supports students, staff and researchers in all facets of their pursuits - to dream, learn, create, and share knowledge.
iii. It also encourages innovation, capitalizes on appropriate technologies, forges effective partnerships, and unequivocally promotes excellence among the vibrant generation.

Fig.1 Entrance of the Learning Centre

Fig.2 Infrastructure

2.3 Access Gate

An automated Access Gate replaces conventional Gate Register. An Average of 4000 walkins per day is reported on each working day. In and Out details of Learning Centre users were automatically recorded. It is possible to notify whether a particular user is present in the Learning Centre at a specific time. The access gate will open subject to scanning of RFID card. His/her entry to Library will be automatically recorded. The user will scan once again while exit.

Thus in and out details of each user with exact time schedule is automatically recorded.

Fig.3 User to enter the library showing RFID Card

Fig.4 RFID Gate

Each user is subject to pass through a two way RFID Gate. Unchecked/unauthorized document while passing through the RFID will ignite siren. This simple procedure safe guards the pilferage of library resources.

2.4 Entrance Lobby

Three numbers of Large screen LED TVs were installed to display

i. Library Bulletin Board / Library PPT
ii. Videos/Photographs of important event held in the Institute/
iii. Welcome Message during VIP visit
iv. Surveillance camera display

2.5 Property Counter

The belongings of the users should be deposited at the Property Counter situated at the Entrance Lobby.

Fig. 5 Property counter

2.6 Self Study Hall

This hall with reading cubicles is exclusively allotted to the users to read their own books, journals, study materials etc.

Fig.6 Self study hall

2.7 Control Room

This Learning Centre comes under CCTV Surveillance with Intelligent Fire Alarm Control system is installed for safety measures. With 100 CCTV cameras installed across the Learning Centre surveillance is made easy. Public Address System (PAS) is also installed for announcement. Emergency exit provision is made in all the floors of the Learning Centre.

Fig.7 CCTV Surveillance

2.8 Users Seating Capacity

Table 1 Users Seating Capacity

Floor	Self Study Hall	Reading Area	Digital Library	Discussion Room	Conference Hall	Total
GROUND FLOOR	90	86				176
FIRST FLOOR		120	96	20	15	251
SECOND FLOOR		200		20	30	250
THIRD FLOOR		200		20	14	234
TOTAL	90	606	96	60	59	911

3. SPECIAL FEATURES

i. Two Discussion rooms each in the First, Second & Third Floors
ii. Two conference Halls with video conference facility, Wi-Fi - LCD Projectors, etc in the First & Second Floors
iii. VIP Lounge is in the third floor
iv. Wi-Fi facility across all sections of Learning centre
v. OPAC – e-catalogue facility in all the floors of Learning Centre
vi. Drinking Water (RO) facility in both the wings of all the floors
vii. Rest Rooms for Gents & Ladies in all floors
viii. Portraits of eminent scientists & celebrities with their quotes are mounted on the walls as wall paper adding special attraction.

Fig.8 Conference hall

Fig.9 Celebrities with their quotes are mounted on the walls as wall paper

4. RFID LIBRARY MANAGEMENT SYSTEM

• The state-of-the-art RFID Library Management System enables easier transactions and perfectly secures all the library resources.
• The RFID based Access Gate allows the user to enter the library only by showing RFID based Smart Card.

4.1 Self-check kiosk

Two self-check RFID Kiosks were installed at the Ground Floor for easy self-check out. A user can check out as many as 5 or more books at a single transaction. The automated system registers each transaction based on item and user ID.

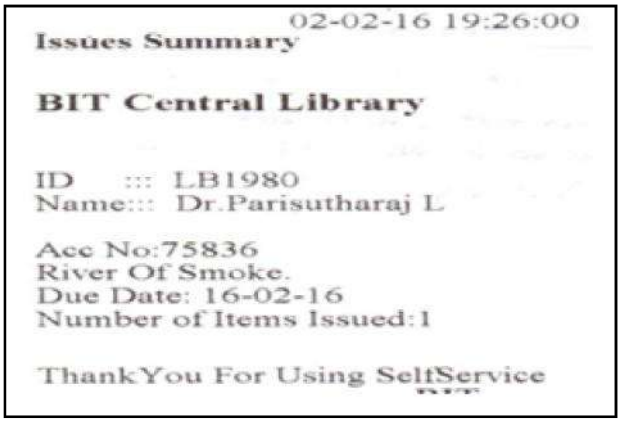
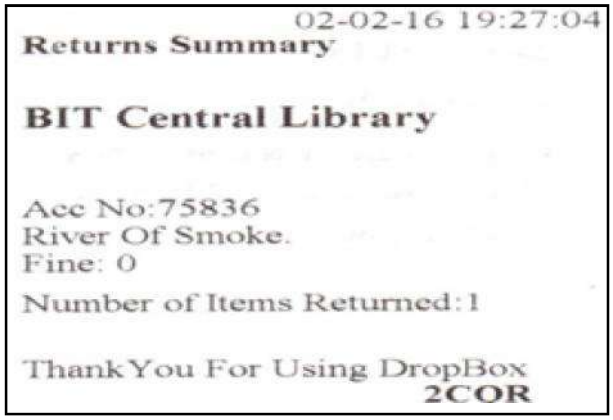


Fig.10 Self Book-Issue

4.2 Book Drop Box

Return of books at any time on all working days. Users can return the books one-by-one. Users will receive return acknowledgement slip and sms alert to his/her registered mobile number.

Fig.11 Book Drop



4.3. Online Renewal

The user can renew the borrowed books through online by logging in "CAMPS", an in-house software. On completion of transaction, the user will get an SMS for renewal.

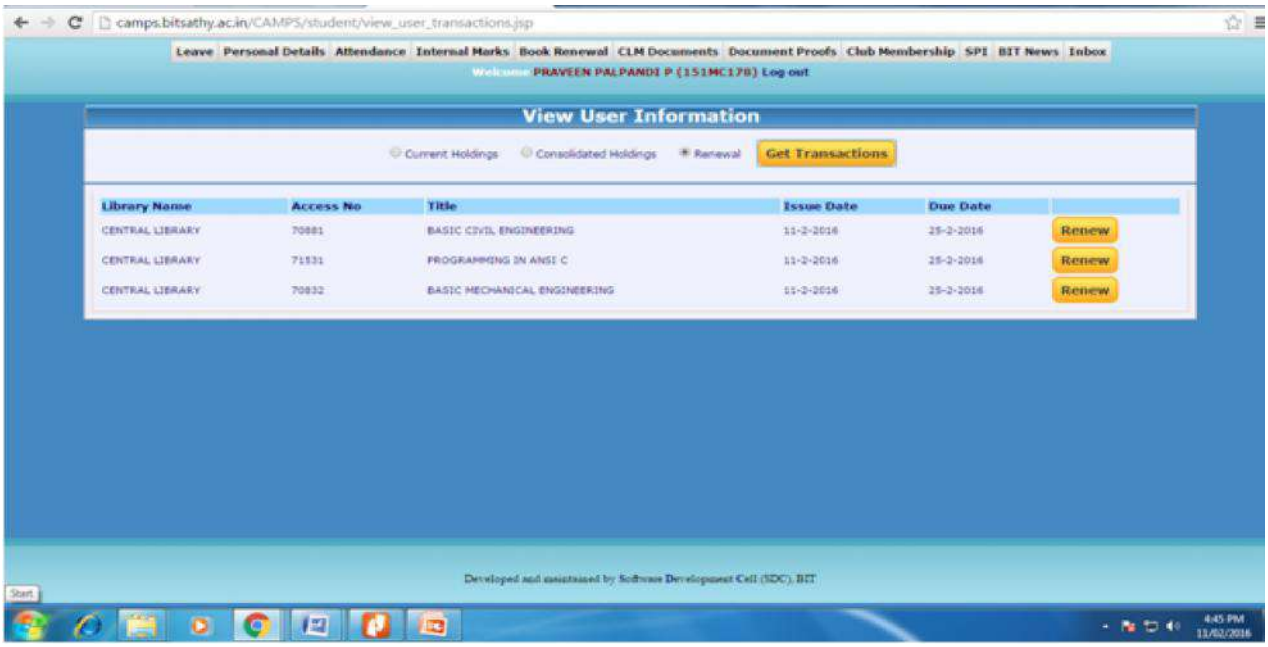


Fig.12 Online renewal

4.4 Reprographic and Scanning

Reprographic section provides photo copies of articles, materials from reference books on payment basis. A scanner is also made available for scanning documents.

4.5 WANDA - RFID Inventory Reader

Wanda, a RFID -enabled stock control unit enables library staff to roam freely among library shelves, unencumbered by trailing wires or heavy equipment. Combining lightweight construction with extended reach, it puts an end to the bending and stretching necessary with other stock management tools!

Wanda's technology enables library staff to trace missing items, track down misfiled or reserved books or take a full inventory of holdings with ease. 2CQR's (Wi-Fi) RFID Inventory Reader uses fast-read performance to simultaneously interrogate between 15 and 20 items per second as you walk the shelves.

Fig.13 WANDA Inventory Reader

5. RESOURCE

5.1 Books

The Learning Centre of the Institute plays a pivotal role in the process of promoting and demonstrating a desire for information and knowledge, and so aiding them in the development of their professional, personal, and spiritual lives.

The resources include specialized collections in basic sciences, engineering & technology, humanities and social sciences.

Total Number of Books - 77210
Total Number of Back Volumes - 4000

Fig.13 Books stack area

5.2 Periodicals (400 Print journals & Magzine)

Includes Journals & Magazines (National / International)

Fig.14 New Arrivals Stand

5.3 Online Journals (6000+)

Learning Centre subscribes to all AICTE mandatory databases for the last 5 years. BIT's is one among few libraries subscribing to IEL (Full package) on IP based access. IEL (IEEE&IEE), ASCE, ASME, PROQUEST, SCIENCE DIRECT, Springer Link, McGraw-Hill Access Engg., ASTM DIGITAL LIBRARY, J -Gate Management & Engg. and Nature.

Fig.15 Digital Library (Online journals)

Table 2 No. of titles Access of E-journals

Sl. No.	Name of the E-Journal/ Publisher	Subjects	No. of E-journals
1	IEL Online Journals	CSE, EEE,ECE & related disciplines	191
2	ASME	Mechanical Engg.,	25
3	ASCE	Civil Engg.,	34
4	Springer	EEE, ECE and CSE Engineering	280
5	McGraw Hill	General Engg	
6	ELSEVIER/Science Direct	EEE,ECE,Mech, Civil, Aero, CSE, IT	538
7	ELSEVIER/Science Direct	Bio Tech (PG)	
8	NATURE	Bio Tech (PG)	3
9	ASTM Digital Library Online version	Online Dictionary of Engg Sci&Tech	8
10	J-GATE (Engg & Tech)*	General Engg	2869
11	J-GATE (Management)*	Management	1949
12	PROQUEST	Management	4000 (Full text

5.4 Media Resources

Compact Discs – 6500
NPTEL – 274
NITTTR – 166

5.5 Library Web OPAC (Online Public Access Catalogue)

15 Nos. of Touch Screen (21.5 inch) terminals are provided exclusively for browsing OPAC at various levels. The library catalogue is searched by author, title, publisher, keyword and year of publication. The users can know the availability and location of the books in the Learning Centre by using these OPAC terminals.

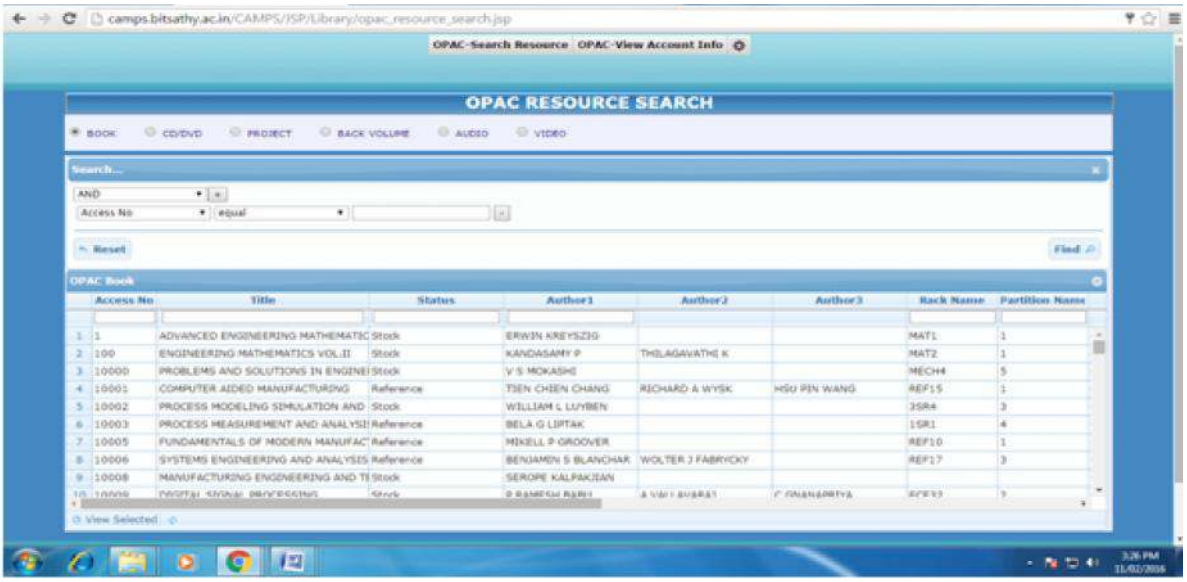


Fig.16 Library Web OPAC

5.6 Institutional Membership

BIT Learning Centre holds Institutional Membership in the following Institutions / bodies.

5.6.1 DELNET (Developing Library Network)

BIT Learning Centre holds the Institutional Membership of DELNET since the year 2002. DELNET provide online access to abstract of journals, book catalogues and Inter Library Loan for exchange of books that are not available in the library.

5.6.2 British Council Library

BIT Learning Centre is an Institutional Member of British Council Library since the year 2000. As the member, BIT will receive 10 membership cards and will be entitled to utilize the resources of BCL. Further, 10 staff of the Institution can access BCL at any point of time.

6. DOCUMENT DELIVERY SYSTEM (DDS)

Inter library loan facility is made available through DELNET. If a user needs a full text article which is not downloadable at the BIT site, then user can sent an e-mail request to the librarian with DOI. Librarian will download the full text articles through Sci-hub, Research Gate and Library Genesis and sent it via e-mail. Thus document delivery is made easy for the faculties, research scholars and PG students.

7. LIBRARY PUBLICATIONS

i. Indian Journal of Science and Technology (IJEST) (ISSN: 0972-6255)

A biannual refereed research journal on science and Technology. Thirteen issues have been published so far.

ii. Indian Jounral of Information Science and Services (IJISS))(ISSN: 0973-8967)

A biannual refereed research journal on science and Technology. Thirteen issues have been published so far.

iii. Newspaper Clippings

Recent news (e-clippings) on Science and Technology are being sent to all users via Group email ID to create general awareness.

Fig.17 Library web portal

8. BEST PRACTICES IN BIT LIBRARY

i. Library Web Portal

The Library web portal: http://lib.bitsathy.ac.in was launched on 18.02.2004. Information on Government, Education, Universities, Scholarships, Competitive Exams, Examination results, Employment, Other Library links and etc., are available in this web portal. All the AICTE mandatory e-journal databases were provided with linkages in the Learning Centre home page. Users can simply click the database and access is provided with ease.

ii. BIT Faculty Publication Alert

BIT Faculty publication alert from Elsevier Science Direct, IEL and springerlink were created. Librarian will get an automatic alert to his registered e-mail as and when a BIT faculty publishes a research article. Librarian in turn publicizes the alert to all faculties using group mail id. The author gets visibility and appreciation by this alert service.

iv. Issue of Receipt for Each Transaction at the Learning Centre

Each user will be provided with acknowledgement slip as well as sms alert to his/her registered mobile regarding transactions made in the Learning Centre.

v. Information of Recent Additions to the Learning Centre

Recent Arrival of books and library usage count details are being notified to all faculties periodically using group mail id. Administrators are provided with weekly/ monthly usage statistics like daily walkins, circulation details.

vi. User awareness programmes are being conducted at regular intervals to promote optimal usage of e-resources.

9. CONCLUSION

The creation of new content format and access has stimulated a redistribution of library space from collection focus to user focus. BIT Learning centre have made more space available for users and their learning. BIT Learning Centre is considered an informal learning space.BIT Learning centre environment allows open conversation and provides space for users to meet in groups and make it conducive for social learning.

A Comparative Analysis of the Faculties of the University of Jaffna in the Field of Research and Development in their Differential Pursuits

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Abstract

The research in all its forms constitute a passage for the manifestation of development of the human individual and human communities both in mind and conduct in the progress of man cannot be denied. This study was conducted to measure by volume the data obtained in a variety of dimensions to find out over a decade from with material of the University of Jaffna. A content of material in the annual report over a period of twelveyears- 2003-2014 were scrutinized. Simple statistics and using bibliometric tools the data compiled were analyzed. The findings revealed that the total number of publications produced are 3808 with an annual average of 317. Abstract forms are relatively greater in number (69.19%).While journal full papers are 22.45% and the remaining 8.35% are books. The relative growth rate (RGR) has descended.0.59 to 0.15. Considering six year blocks from 2003 to 2014 the mean RGR would be respectively 0.293 and 0,168.. The total for independent faculties in percentage give 39% for Arts and 21.92% for science. The other three faculties of Agriculture, Management and commerce and Medicine have roughly performed equally well their contributions being 12.44%, 13.55% and 12.55% respectively. Doubling time from the first block of six years, it is 1.99 and for the second block of six years it is 4.15. The degree of collaboration of authors it is found to be 0.43. It is evident that probable number of records 2142 (56.25%) were published by single author. remaining were prepared in combination either by two authors (16.17%) or more than two authors (3-5) were 21.95% and again more than five authors (5.61%). The forecast for 2020 the publication should be 649 status remaining unchanged. Being the only University in the northern part of Sri lanka continued progress in the line of action and purpose has to be felt.

Keywords: *Research output , Bibliometric study, Higher education research, University of Jaffna*

1. INTRODUCTION

Any form of academic effort with corresponding practical application become obsolete without research and development. Teachers of all caliber have to keep pace with new findings. Teaching goes with learning hand in hand. Researchers have been contributing to research and development in natural and applied sciences, humanities and social sciences perpetually.

Research output means contribution to existing body of knowledge. Dissemination, diffusion and utilization are considered channels of transfer of knowledge. There are lesser forms of transfer of knowledge now obsolete, enter cyber space and nanotech.

Sri Lanka has much potential for development and can do well investing in research in the relevant sectors. The intellectual resources are available in a dwindling form. The universities provide the core academic resource. Now the Ministry of Higher Education in Sri Lanka has introduced a new research grant scheme to help promote innovative research. Academic staff of all disciplines get financial assistance to undertake basic, applied and adaptive research relevant to the region and the nation.

2. LITERATURE REVIEW

An academic career growth and credibility still depends on his or her research and publication records (Ocholla., D.N.,1999). There have been a variety of studies conducted in analyzing the research output of individual institutions. Thus the following details. R. Duraipandi and R. Balasubramani (2015) conducted a bibliometic study based on scopus database on mapping the research productivity of Jawaharlal Nehru University. Mallinath Kumbar, B.M.Gupta and S.M.Dhawan (2008) carried a case study about the growth and impact of research output of University of Mysore during the period of 1996-2006. V. K. J. Jeevan and B,M, Gupta (2002) conducted a scientometric analysis of research output from Indian institute of technology, Kharagpur. A Scientometric mapping of remote sensing research output was carried out by C. Murugan, and R. Balasubramani during 2015.

3. OBJECTIVE

The main objective of this study is to measure by volume the data obtained in a variety of dimensions to find out the faculty wise output, exponential growth rate, doubling time authorship pattern and degree of collaboration, average annual output, year wise growth major areas of research and the future publication expectations.

4. METHODOLOGY

4.1 Target Institution, Sampling and Data Collection

Considering the University as target institution which would be the sample evaluating the publications of the University academic staff .The material for the scrutiny was obtained from the annual report of the University of Jaffna . A content of material over a period of twelve years-2003 – 2014 were scrutinized. Entire publications from the academics of five faculties of University of Jaffna namely, Faculty of Science, Faculty of Arts, Faculty of Medicine, Faculty of Agriculture and the Faculty of Management and commerce were taken. The result was used to analyze growth and influence of university research. To confirm accuracy a wider time frame was considered.

5. DATA ANALYSIS

The data collected were compiled and fed into the Excel worksheet and processed. Dealing with simple statistics such as mean, percentage, tables and graph and using bibliometric tools the data compiled were analyzed. Least square mathematical method for time series trend fitting was used to forecast the publication.

6. RESULTS AND DISCUSSION

6.1 Year-wise Publication Output

The statistics show a total publication number of 3808 of which the breakdown is as shown in the table 1 as it was during 2003-2014. The average output per annum is given as 317.

Table 1 Year-wise Publication Output

Year	Total Number of Publications
2003	239
2004	190
2005	204
2006	268
2007	151
2008	335
2009	282
2010	340
2011	404
2012	412
2013	467
2014	516
Total	**3808**

6.2 Document Format-wise Output

It would appear that abstracts are relatively greater in number (69.19%).While journal full papers are 22.45% and the remaining 8.35% are books. Definitely journal publications will be more substantial. Books however properly written have the capacity to be exhaustive. In its entirety then, success depends on application of the knowledge disbursed.

Table 2 Document Format-wise Output

Document Type	Journal Full Paper	Abstracts	Books	Total
Number of Publications	855	2635	318	3808
In percentage %	22.45%	69.19%	8.35%	

6.3 Faculty-wise Publication Output

The total for independent faculties in percentage give 39% for Arts and 21.92% for science. The other three faculties of Agriculture, Management and commerce and Medicine have roughly performed equally well their contributions being 12.44%, 13.55% and 12.55% respectively.

Table 3 Faculty-wise Publication Output

Year	Agriculture	Arts	Management.& Commerce	Medicine	Science	Total
2003	27	130	20	29	33	239
2004	15	116	13	18	28	190
2005	19	99	18	19	49	204
2006	26	125	11	25	81	268
2007	18	56	14	16	47	151
2008	67	98	43	39	88	335
2009	53	121	15	27	66	282
2010	51	128	68	32	61	340
2011	26	167	105	31	75	404
2012	57	119	66	64	106	412
2013	64	165	52	92	94	467
2014	51	185	49	124	107	516
Total	474	1509	474	516	835	3808
In percentage	**12.44%**	**40%**	**12.44%**	**13.55%**	**21.92%**	

6.4 Exponential Growth Rate

Table 4 shows that the relative growth rate (RGR) has descended.0.59 to 0.15. Considering six year blocks from 2003 to 2014 the mean RGR would be respectively 0.293 and 0,168. The mean doubling time from the first block of six years, it is 1.99 and for the second block of six years it is 4.15. The forecast for 2020 the publication should be 649 status remaining unchanged. Considering all twelve years for degree of collaboration of authors it is found to be 0.43.

Table 4 Exponential Growth Rate

Year	No. of Publications	Cumulative Total	LogeW1	LogeW2	RGR	Mean RGR	DT	Mean DT
2003	239	239		5.47				
2004	190	429	5.47	6.06	0.59		1.17	
2005	204	633	6.06	6.45	0.39		1.77	
2006	268	901	6.45	6.80	0.35		1.95	
2007	151	1052	6.80	6.95	0.15	0.293	4.62	1.99
2008	335	1387	6.95	7.23	0.28		2.47	
2009	282	1669	7.23	7.41	0.18		3.85	
2010	340	2009	7.41	7.60	0.19		3.64	
2011	404	2413	7.60	7.78	0.18		3.85	
2012	412	2825	7.78	7.94	0.16	0.168	4.33	4.15
2013	467	3292	7.94	8.09	0.15		4.62	
2014	516	3808	8.09	8.24	0.15		4.62	

6.5 Collaboration Pattern of Authorship in Research

It is evident that probable number of records 2142 (56.25%) were published by single author. Remaining were prepared in combination either by two authors (16.17%) or more than two authors (3-5) were 21.95% and again more than five authors (5.61%).

Table 5 Collaboration Pattern of Authorship in Research

Faculties	Single (1A)	Double (2A)	Multi (3-5)	Mega(>5)	Total
Agriculture	76	178	185	35	474
Management and Commerce	333	110	31	0	474
Medicine	109	65	286	56	516
Arts	1453	44	12	0	1509
Science	171	219	322	123	835
Total	**2142**	**616**	**836**	**214**	**3808**

7. CONCLUSION

The net result should focus on the improvement of the lifestyle and cost of living at grass root levels. With this end in mind the overall effort has to be applied. That one faculty is unable to fair as another is not because of lack of interest. Rather it is because of lack of personnel, funds and research equipment. Coordination between universities, researchers, and industries will lead to a maximum output from different faculties. This will lead to creation of new knowledge. Yet a tangible progress can be seen in research effort. Being the only institution in the peninsular region it has to be said that it has discharge its duties more than satisfactorily. However continued progress in the line of action and purpose has to be felt.

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A Scientometric Analysis of Acoustics Research in India

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Abstract

This study examined the growth of acoustics research in India from the year 2000-2104.A total of 946 records were downloaded from Web of science database. The findings revealed that Indian institute of technologies and Indian institute of science were the major producers of research output in optical computing. The top ten journals produced more than one by fourth of the total research output and in the extent of international collaboration India had often collaborated with U.S.A, contributing to 31 records with a global citation score of 658.Contribution of journals, ranking of authors, preference of publication etc., were also analyzed in this paper.

Keywords: *Acoustics, Citation, Scientometrics, Web of science*

1. INTRODUCTION

Acoustics is the interdisciplinary science that deals with the study of all mechanical waves in gases, liquids, and solids including topics such as vibration, sound, ultrasound and infrasound. A scientist who works in the field of acoustics is an acoustician while someone working in the field of acoustics technology may be called an acoustical engineer. The application of acoustics is present in almost all aspects of modern society with the most obvious being the audio and noise control industries.The science of acoustics has many applications which are dependent upon the nature of the sound that is to be produced, transmitted or controlled.In the case of a desirable sound, such as music, the main application of acoustics is to make the music sound as good as possible. In the case of an undesirable sound, such as traffic noise, the main application of acoustics is in noise reduction.Another major area of acoustics is in the field of ultrasound which has applications in detection, such as sonar systems or non-destructive material testing. *Scientometrics*is a study, measuring the. "Quality" of science where emphasis is placed on investigations where the mechanisms of science are studied by statistical methods. This paper analyzes the core areas in the field of Anesthesiology research in India.

2. OBJECTIVES

The objectives of the present study are:

i. To examine the growth of research productivity in the field of acoustics in India.
ii. To identify the document wise distribution of publication.
iii. To find out the extent of international collaboration.
iv. To determine the ranking of authors based on publications.
v. To assess the journal wise distribution of publication.
vi. To analyze the top institutions contributed acoustics research in India.

3. METHODOLOGY

The data for the study were retrieved from web of science database which is a scientific and indexing service maintained by Thomson Reuters. The acoustics research productivity of India was analyzed. The following search strategy has been used to extract data for the study.

ADDRESS-ABS-KEY ("India") AND TOPIC-ABS-KEY ("Acoustics") AND PUBYEAR (2000-2010).

The bibliographic details such as authors, document types, collaboration etc were analyzed using Histcite which is a software package used for bibliometric analysis and information visualization.

4. SCOPE OF THE STUDY

Due to various constraints**,** the present study analyzed the Acoustics research output in India only during the period 2000- 2010.

5. ANALYSIS

A total of 946 records were published by the by researchers in the field of Acoustics in India from the year 2000-2010. The research output was analyzed using various scientometric indicators.

5.1 Year-wise Publications

Table 1 shows the year wise publications in acoustics research in India from the year 2000-2010.The highest number of publications in even the year 2009 with 108 records, having a global citation score of 1243. It also shows that even minimum numbers of records have scored higher global citation scores. It is clearly seen form the table that publications is varying during the study period, which indicates a fluctuating trend in acoustics research in India.

5.2 Ranking of Authors

Table 2 indicates the ranking of top ten authors by the number of publications in acoustics research in India. It is clearly seen from the table that Pandit AB has published the highest number of publications with 39 records, having a global citation score of 1482, followed by Vijayaraghavan SB with 27 records, having a global citation score of 186.

Table 1 Year-wise Distribution of Publication on Acoustics Research in India

Sl. No.	PUBLICATION YEAR	RECORDS	TLCS	TGCS
1	2000	44	30	650
2	2001	58	40	996
3	2002	71	56	1124
4	2003	88	53	1069
5	2004	86	65	1072
6	2005	92	45	1128
7	2006	100	35	1348
8	2007	94	31	1191
9	2008	113	27	1343
10	2009	108	19	1243
11	2010	92	5	915
	TOTAL	946	406	12079

Table 2 Ranking of Authors by the Number of Publications in Acoustics Research in India (Top Ten)

Sl.No.	Author	RECS	TLCS	TGCS
1	Pandit AB	39	47	1482
2	Vijayaraghavan SB	27	7	186
3	Ganesan N	25	12	406
4	Gogate PR	25	19	934
5	Munjal ML	24	19	151
6	Kumar R	21	12	181
7	Rao GV	17	6	56
8	Yegnanarayana B	17	17	480
9	Sharma JN	16	20	216
10	Narayanan S	15	9	272

5.3 Contribution of Journals

The study found out the total research output on acoustics research in India, comprising of 859 records were published in 29 journals during the period 2000-2010. The top ten journals produced more than one by fourth of the total research output. The journal "Journal of Sound and Vibration" stands first with 390 records, having a global citation score of 5651, followed by the journal "Ultrasonics Sonochemistry"with 98 records, having a global citation score of 2996.

Table 3 Distribution of Publication on Optical Computing by Journals (Top ten)

Sl.No.	JOURNAL	RECORDS	TLCS	TGCS
1	Journal Of Sound And Vibration	390	208	5651
2	Ultrasonics Sonochemistry	98	73	2996
3	Journal Of Clinical Ultrasound	69	3	420
4	Journal Of Ultrasound In Medicine	61	8	361
5	Journal Of The Acoustical Society Of America	55	48	571
6	Journal Of Vibration And Control	40	14	233
7	Journal Of Vibration And Acoustics-Transactions Of The ASME	30	5	102
8	Applied Acoustics	26	7	199
9	IEEE Transactions On Ultrasonics Ferroelectrics And Frequency Control	22	3	103
10	Shock And Vibration	19	1	44

5.4. Distribution by Institution

This table presents the contribution of top ten institutions in acoustics research in India. It is clearly seen from the table that Indian Institute of Technologies has the maximum number of publications with 344 records having a global citation score of 4897, followed by Indian Institute of Science with 93 publications, having a global citation score of 928.

Table 4 Distribution of Publication in Optical Computing by Institution (Top ten)

Sl.No.	Institution	Records	TLCS	TGCS
1	Indian Institute of Technologies	344	153	4897
2	Indian Inst Science	93	54	928
3	Kurukshetra University	22	13	202
4	Vikram Sarabhai Space Ctr	22	5	93
5	Jadavpur University	20	8	156
6	National Institute of Technologies	20	8	186
7	Deemed Universities	19	12	166
8	Univ Bombay	19	30	810
9	Naval Phys & Oceanog Lab	15	9	83
10	Sonoscan Ultrason Scan Ctr	15	5	126

5.5. International Collaboration

Table 5 depicts the extent of top ten International collaboration of India with other countries in acoustics research from the period 2000-2010. The study found out that India has collaborated in optical computing research with 27 countries. It is inferred from the table that India has often collaborated with U.S.A, contributing to 31 records having a global citation score of 658. Followed by UK contributing to 13 and 8 records with global citation scores of 338.

Table 5 Extent of International Collaboration in India (Top ten)

Sl.No.	Country	RECS	TLCS	TGCS
1	USA	31	10	658
2	UK	13	8	338
3	Canada	8	4	133
4	Germany	8	2	75
5	France	7	10	209
6	Japan	5	0	42
7	Netherlands	4	3	36
8	Australia	3	1	41
9	Malaysia	3	0	27
10	Czech Republic	2	1	191

6. SUMMARY AND CONCLUSION

In this study, a scientometric analysis has been undertaken to show the current state of acoustics research in India. The findings of the study discovered that totally 946 records were published on acoustics research in India. Indian institute of technology and Indian

institute of science were the major producers of research output in acoustics research. In the contribution of journals, the journal "Journal of Sound and Vibration" stands first with 390 records, having a global citation score of 5651, followed by the journal "Ultrasonics Sonochemistry"with 98 records, having a global citation score of 2996.In the extent of international collaboration India has often collaborated with U.S.A, contributing to 31 records having a global citation score of 658, followed by UK and Canada contributing to 13 and 8 records with global citation scores of 338 and 133 respectively.In the ranking of authors, Pandit AB has published the highest number of publications with 39 records, having a global citation score of 1482, followed by Vijayaraghavan SB with 26 records, having a global citation score of 270.The publications has been varying considerably every year, which shows a fluctuating trend in optical acustics research in India during the period 2000-2010.

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5. Manuscript will be reviewed by experts in the corresponding research area, and their recommendations will be communicated to the authors.

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The manuscript should be about 8 pages in length, typed in double space with Times New Roman font, size 12, Double column on A4 size paper with one inch margin on all sides and should include 75-200 words abstract, 5-10 relevant key words, and a short (50-100 words) biography statement. The pages should be consecutively numbered, starting with the title page and through the text, references, tables, figure and legends. The title should be brief, specific and amenable to indexing. The article should include an abstract, introduction, body of paper containing headings, sub-headings, illustrations and conclusions.

References

A numbered list of references must be provided at the end of the paper. The list should be arranged in the order of citation in text, not in alphabetical order. List only one reference per reference number. Each reference number should be enclosed by square brackets.

In text, citations of references may be given simply as "[1]". Similarly, it is not necessary to mention the authors of a reference unless the mention is relevant to the text.

Example

[1] K.C.Garg, B.Dutt and Suresh Kumar, "Scientometric Profile of Indian Science as Seen Through Science Citation Index", Annals of Library and Information Studies, Vol. 53 No. 3, 2006, pp.114-125.
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CONTENTS