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**Indexing information:** The journal is indexed with google Scholar, Index Copernicus, Poland, EBSCO Publishing's Electronic Databases, USA, Library & Information Science Source, USA, National Science Library, New Delhi, ProQuest, UK, Genamics JournalSeek, Scientific Indexing Services, USA.

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Printed at: R.V. Printing Press, C-97, Okhla Industrial Area Phase-I, New Delhi - 110 020.

The Indian Journal of Library and Information Science (Print ISSN 0973-9548, Online ISSN 0973-9556, Registered with Registrar of Newspapers for India: DELENG/2007/22242) provides comprehensive international coverage of library & information science and technology. IJLIS is published 3 times a year by the Red Flower Publication Pvt. Ltd.

It presents peer-reviewed survey and original research articles on specific areas are: new information technology, education and training, human resource management, the changing role of the library, future developments, opportunities, bibliographic databases, cataloging issues, electronic publishing, acquisitions, collection development, administration, management, archives, preservation, and special collections, automation and cataloging. Its papers include letters to the editor, book reviews, calendar of events, conference reports, interviews, and much more.

**Readership:** Scholars, professionals, practitioners, faculty, students in the field of library and information science

**Indexing information:** The journal is indexed with google Scholar, Index Copernicus, Poland, EBSCO Publishing's Electronic Databases, USA, Library & Information Science Source, USA, National Science Library, New Delhi, ProQuest, USA, Genamics JournalSeek.

#### **Subscription Information**

India

Institutional (1 year) (Print+Online): INR 9000

Rest of the World Insitutional (1 year) (Print+Online): USD643

# **Payment instructions**

*Online payment link:* http://rfppl.co.in/payment.php?mid=15

#### Cheque/DD:

Please send the US dollar check from outside India and INR check from India made. Payable to 'Red Flower Publication Private Limited'. Drawn on Delhi branch

*Wire transfer/NEFT/RTGS:* Complete Bank Account No. 604320110000467 Beneficiary Name: Red Flower Publication Pvt. Ltd. Bank & Branch Name: Bank of India; Mayur Vihar MICR Code: 110013045 Branch Code: 6043 IFSC Code: BKID0006043 (used for RTGS and NEFT transactions) Swift Code: BKIDINBBDOS

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# Status of Government District Libraries of Uttar Pradesh A State of India in 21<sup>st</sup> Century: A Study

# Anubhav Shah\*, Sharad Kumar Sonkar\*\*

# Abstract

District library is an apex body of the district generally located in the district center. It functioning as a leading and reference library for the district, books and other reading materials are purchased, technically processed and distributed to all public libraries in a district by the district library authority. The administration, inspection and monitoring of various public libraries located in district are carried out by the district Library authority. This study is limited to the Librarians/ Library In-charge working in Government District Libraries of Uttar Pradesh. The study illustrates that out of 75 districts of Uttar Pradesh, 70 districts are providing a facility of government district libraries. It was also examined by the study that only 41 Librarian are working in 68 district library of Uttar Pradesh was satisfied with their ICT facility out of 68 libraries. The overall satisfaction rate about the library budgets received by the Librarian/ Library incharge was shown that 91.17% respondents of government district libraries were not satisfied with their library budgets. This study has a great importance, interest and great significance, not only for the scholars and professionals associated with government district libraries of Uttar Pradesh, but also to the policy makers, planners, state library authorities and the State Government. On the behalf of this study the State Government can take a positive decision for the betterment of the government district libraries.

Keywords: District Library; Library Staff; Physical Facility; Classification & Cataloguing etc.

#### Statement of the Problem

Government districtlibrary is expected to perform the functions of providing for recreation, information, inspiration and education. It serves the local community and open for public without any distinction. It may include public, student, teachers, research scholars, businessmen, professionals, housewives, retired person, etc. We knew that government district libraries come under the category of public library.

Public library run in the interest "of public for the people, by the people of the people" (Shahl, 2008).

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Received on 21.06.2017, Accepted on 28.06.2017

This study entitled "Status of Government District Libraries of Uttar Pradesh" give the realistic view of district libraries available in Uttar Pradesh, and evaluate the performance of the district libraries in 21<sup>st</sup> century. We all know that successful democracy meaning is achieved by the public libraries, so many measures have been taken for the development of public library in India but the actual status of public libraries is not satisfactory due to so many causes. Uttar Pradesh state are one of them where the condition of public libraries are not appropriate according to the necessitate of invention. In this present century where we are taking to implement the latest technologies, skill professionals, Interactive learning, Digital Library, Virtual library, etc. in libraries, but the actual status of public libraries are suffering for all of these things. The development of public libraries is mostly dependent upon the constitution of a public library and the interest of concerned state government. Uttar Pradesh is one of the biggest states of India which consisting 18 divisions (Manduls) and 75 districts where every district have own government district library for their

community so it is essential to evaluate the present status of government district libraries according to the need of the generation.

It is very crucial to know the status of the permanent professionals staff available in libraries, status of library collections, library services provided by professionals, Infrastructure about the library, use of ICT application and equipment in libraries, pattern of governance of government district libraries in Uttar Pradesh, and the status of libraries budgets provided by the state government and coordinating agencies to the libraries etc. Thus the present research is acknowledged as "Status of Government District Libraries of Uttar Pradesh."

# Significance of the Study

A carefully study of available literature, it has been revealed that numbers of study on public libraries have been conducted but none of any study has been previously conducted so far regarding to the status of government district libraries in Uttar Pradesh. To the best of researcher knowledge this study is first study in the history of government district libraries of Uttar Pradesh where all district libraries are personally visited by the researcher.

"Status of Government District Libraries of Uttar Pradesh" is a topic of great importance, interest and great significance, not only for the scholars and professionals associated with government district libraries of Uttar Pradesh, but also to the policy makers, planners, state library authorities and the State Government. On the behalf of this study the State Government can take a positive decision for the betterment of the government district libraries.

# Objectives of the Study

The Objectives of the present study are:

- To examine the current pattern of governance.
- To identify the collection and services of government district libraries.
- Find out the status of government district libraries staffs.
- To identify the various problems faced by the government district libraries of Uttar Pradesh for smooth functioning.
- To examine the use of ICT application in government district library of Uttar Pradesh for promotion and modernization of library activities and services.
- To find out the libraries budget, infrastructure

and other library facilities for general persons.

 To investigate the problems faced by government district libraries in implementation of information technology and creation of the modern library and information services.

# Scope and Limitation of the Study

The scope of the study is limited to the Librarians/ Library In-charge working in Government District Libraries of Uttar Pradesh. Uttar Pradesh is one of the states of India which include 18 divisions and 75 districts where every district contains one district library for local audiences. The scope of the study covers 18 divisions which included 75 districts of Uttar Pradesh state of Northern India. In this study researcher selected all 75 district libraries of Uttar Pradesh which are given bellow.

# **Research Methodology**

Research methodology is a way to systematically solve the research problem. "Research is common parlance refers to a search for knowledge. Another one can also define that research as a scientific and systematic search for relevant information on a specific topic" (Khotari,2010).

#### Survey Research

Survey research is a very common type of research to collect quantitative data in social science research. In it, research selects a sample of the respondents from the universe of the population. A "survey can be anything from a short paper and pencil feedback form to an intensive one in depth interview (Research, 2006)". Researcher found to most suitable research to collect primary data from respondents. In this study questionnaire method has used as tool of data collection. It is a research instrument consisting series of question and other prompts for the purpose of gathering information from respondents. A structured questionnaire will be design to collect data from the Professionals of government district libraries of Uttar Pradesh. Interview method will also useif applicable in the present study.

#### Data Analysis and Interpretation

Mathematical and Statistical method if applicable are used for data analysis. It has been grouped into five sections on listed in a questionnaire, i.e. Part A, General information about library, Part B, Examine the depth information about the permanent staff of libraries, Part C, Explore the collection and services provided by the districts libraries, Part D, Deal with the use of ICT application/technology and equipment by the libraries, Part E, Shows the status of libraries infrastructure and Part F, Deal with the satisfaction towards library budget.

#### Part A: General Information

# Status of Availability of Government District Libraries in Uttar Pradesh

#### **Respondents Responses**

In order to know the status of Government District

Libraries of Uttar Pradesh State of Northern India, the study concluded that out of 75 districts of Uttar Pradesh, 70 districts are providing a facility of Government District Libraries. In order to receive the responses from the Librarians/Library In-charges 70 questionnaires were distributed to the library professionals, out of which 68 respondents responded. The details descriptions about the status of availability of government district libraries are given in Figure 1.



# **Government District Libraries and thier Responses**

Status of Government District Libraries in Uttar Pradesh

The result indicates that out of 75 districts of Uttar Pradesh 70 districts have a facility of government district libraries and rest of 5 districts, namely Hapur, Kashganj, Sambhal, Shamli, and Shultanpur do not have a facility of government district libraries. Figure 1 shows that 68 (97.14%) responses received by the researcher. Only Sant Ravidas Nagar and Kaushambi districts of Uttar Pradesh do not responses for given questionnaire.

Table	1:

S. No	Year of Establishment	No of Libraries Establish	Percentage (%)
1	1950-1960	07	11.11%
2	1961-1970	01	1.58%
3	1971-1980	00	00
4	1981-1990	29	46.03%
5	1991-2000	06	9.5%
6	2001-2010	05	7.9%
7	2011-Till Date	15	23.80%
8	Total	63	100%
9	Total No of Questionnaire Distributed	68 (100%)	
10	Total No of Responses Received	63 (92.64%)	

# Year -Wise Establishment of Government District Libraries

In order to know the establishment year of government district libraries of Uttar Pradesh researcher asked a question to the respondents and concluded their result in a 10-year intervals from 1950 to till date. In this regard researcher distributed 68(100%) questionnaires to the respondents and received 63(92.64%) responses only 5(7.35%) government district libraries namely Hamirpur, Hardoi, Bijnor, Amethi, and Gonda were not

100

responded for the question. Table 1 illustrates that the establishment of Government District Libraries in Uttar Pradesh was started between, 1950 to 1960, for that interval, 7 District Libraries were found, these districts libraries are Badaun, Bareilly, Jhansi, Kanpur, Mathura, Meerut, and Varanasi. The golden age for the establishment of Government District Table 2:

Libraries in UP were examined between 1981 to 1990 in this period 29 (46.03%) government district libraries were established in Uttar Pradesh. From 2001 to 2010, 5 (7.9%) district libraries were established. Second uppermost period of establishment of government district libraries was examined from 2011 to till date in this period 15 (23.80%) district libraries were established.

S. No	Library Timing	No of Library N= 68	Percentage %
1	8am to am10 Than pm2 to pm6 in Summer	32	47.05%
	9 am to am 11Than pm1 to pm 5 Winter		
2	8 am To 3 pm	1	1.4%
3	9 am To 4pm	3	4.41%
4	9 am To 5 pm	1	1.4%
5	10 am To 4pm	1	1.4%
6	10 am to 5 pm	27	39.7%
7	11am To 5 pm	1	1.4%
8	12am To 6 pm	2	2.9%
	Total	68	100%

# Library Timing of Government District Libraries

In order to identify the status of timing of district libraries in Uttar Pradesh, Table 2 shows the variation in libraries timing. It implies that 32 (47.05%) district libraries followed standard library timing specified by OSD office of public library of Uttar Pradesh which was 8 am to 10 am than 2 pm to 6 pm in summer and 9 am to 11 am than 1 pm to 5 pm in winter days. 27(39.70 %) district libraries were pursuing their timing from 10 am to 5 pm regularly and 3 (4.41%)

district libraries were pursuing their library timing from 9 am to 4 pm. Only 2(2.90%) district libraries were pursuing their library timing from 12 am to 6 pm. 1(1.4%) library was followed their library timing between 11 am to 5 pm; 1(1.4%)district library was followed from 9 am to 5 pm and next 1(1.4%) district library preferred 8 am to 3 pm regularly.

# Part B: Information about Library Staff

# Status of Permanent Staff

In order to identify the status of permanent government district libraries staff Figure 02 (Below) depicts that out of 68 (97.14%) responses received by the researcher 41 (69.29%) libraries have permanent Librarian and rest of 27 (39.70%) post are vacant in this current situation (till 7/Apr/2016). The following data shows that only 15 (22.05%) libraries are holding the permanent position of Assistant Librarian / Cataloguer. In the context of

permanent position of the 4th class employee 38 (55.88%) district libraries of Uttar Pradesh are possess that position.In the context of security of district libraries, only 7(10.29%) Guards are available in 68 district libraries. The data shows that district libraries of Uttar Pradesh are struggling for smooth functioning due to insufficient numbers of permanent staffs. So it is necessary to the state government should take positive decisions for the recruitment of professional staffs in district libraries.



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**Note: 1-** Above table and figure shows the status of permanent staff available in district libraries of Uttar Pradesh in 21<sup>st</sup> century. Before the 5 decade in the financial year of 1957 to 1958 government of Uttar Pradesh had taken an concrete decision for the appointment of District Libraries Staffs, the Section B of the official letter no G-II/P/134/XVIIA-10(1)/57-58, dated 19 June, 1957 had clearly mentioned the statement about the temporary staffs appointed for all 9 district libraries of Uttar Pradesh as given.

- Nine Librarians one for each Library in the scale of Rs. 75-5-120-EB-8-200.
- Nine Cataloger one for each Library in the scale of Rs. 60-4-80-EB-4-100.
- Nine Clerks one for each Library in the scale of Rs.60-4-80-EB-4-100.
- Nine Book Binder cum-Book Lifters one for each Library in the scale of Rs. 32-1-37.
- Twenty Seven Inferior Servants, three for each Library in the scale of Rs.27-1/2-32.

At that time there was not any single permanent post was available in District Libraries but the statement was showed that 7 numbers of staffs were working in each District Library. According to the statement; 63 staffs were working in 9 District Libraries. But the present situation shows that only 101 permanent staffs are working in 68 district libraries. So it can be criticize by the decisions maker of the district libraries.

#### Status of Qualification of the Librarians



Fig. 3:

Figure 3 shows the actual status of qualification of the librarians available in government district libraries of Uttar Pradesh. In order to know the status of their qualifications researcher asked from them and received 39 (95.12%) responses from 41 (100%) Librarians; Out of 39 (100%) librarians majority of librarians 21 (53.84%) possess Master of Library and Information Science (M.L.I.Sc) degree than followed by 15(38.46%) librarians have Bachelor Degree of Library and Information Science (B.L.I.Sc); Only 1 (2.56%) librarian has Diploma in Library and Information Science and 2(5.12%) librarians have Certificate in Library and Information Science.

#### Gender - Wise Shorting of the Librarian

Table 3 shows the gender wise classification about the Librarians available in Government District Libraries in UP. It implies that out of 41(100%) librarians 33(80.48%) librarians are Male and rests of 8 (19.51%) librarians are Female (till 7/Apr/2016). It shows that majority of librarians available in district libraries are Male.

#### Table 3:

No of Responses	Male	Female	
41(100%)	33 (80.48%)	8(19.51%)	

#### Experience-Wise Classification of the Librarians

Status of Permanent Library Staff, Satisfaction towards Smooth-Functioning and Adequate Staff.

No of Respondents	Satisfaction with Working Style (Smooth Functioning)	Satisfaction with Staff Adequate
68(100%) 16 (23.52%) Satisfy		4(5.88%) Satisfy
	52 (76.47 %) Unsatisfied	64 (94.11%) Unsatisfied
Total	68 (100%)	68 (100%)

In order to evaluate the status of working style of library staffs for smooth functioning of libraries table 4. illustrates that only 16 (23.5%) libraries were satisfied with their staffs, rest of 52 (76.47%) government district libraries are unsatisfied with the working style of their permanent library staffs.

In order to identify the status of library staffs are adequate, study concluded that only 4 (5.88%) libraries were satisfied with their staffs available in district libraries and majority of the respondents 64 (94.11%) were unsatisfied with their libraries staffs available in libraries.

Note. All of respondents for that question, 64 (94.11%) were demanding for more permanent staffs in libraries, they recommended that at least 2 library assistant, 1 permanent Sentry; One 4<sup>th</sup> class employee and 1 permanent Sweeper in each district libraries.

Status of Library Classification and Cataloging



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In order to know the status of library classification and cataloging facility provided by the government district libraries of Uttar Pradesh figure 04 shows that out of 68 (100%) libraries only 22 (32.35%) district libraries were providing the facility of classification to the users and only 16 (23.52%) libraries were providing the facility of catalogue for the users. We all knows that Classification and Cataloguing are one of the initial facility of the libraries but it is ridicules that 46 (67.64%) district libraries were not using classification scheme to classified the subject and 52 (76.47%) libraries were running without library catalogue facility in Uttar Pradesh.

Status of Users in Government District Libraries

Table 5:

S. No	District Lib.	No. Users	S. No	District Lib.	No. Users	S. No	District Lib.	No. Users
1	Agra	1945	26	Farrukhabad	325	51	Meerut	6000
2	Aligarh	750	27	Fatehpur	142	52	Mirzapur	196
3	Allahabad	255	28	Firozabad	273	53	Moradabad	900
4	Ambedkar.N.	50	29	Gaziabad	800	54	Muzaffarnagr	736
5	Amethi	363	30	Ghazipur	260	55	Noida	17
6	Amroha	10	31	Gonda	913	56	Pilibhit	80
7	Auraiya	50	32	Gorakhpur	3068	57	Pratapghar	300
8	Azamgarh	1400	33	Hamirpur	275	58	Raebareli	800
9	Badaun	450	34	Hardoi	182	59	Rampur	370
10	Bagpat	00	35	Hathras	28	60	Saharanpur	30
11	Bahraich	989	36	Jalaun	410	61	Santkabirnagar	3
12	Ballia	518	37	Jaunpur	485	62	Shahjahanpur	200
13	Balrampur	15	38	Jhansi	1053	63	Shrawasti	50
14	Banda	550	39	Kannauj	no	64	Siddhartnagar	230
15	Barabanki	760	40	Kanpur	2850	65	Sitapur	1326
16	Bareilly	833	41	Kanpur Dehat.	160	66	Shonbhadra	552
17	Basti	870	42	Kushinagar	12	67	Unnao	1500
18	Bijnor	185	43	Lakhimpur	1600	68	Varanasi	910
19	Bulandshahr	630	44	Lalitpur	600			
20	Chandauli	3	45	Lucknow	700			
21	Chitrakoot	08	46	Maharajganj	20			
22	Deoria	425	47	Mahoba	25			
23	Etah	260	48	Mainpuri	1037			
24	Etawah	625	49	Mathura	992			
25	Faizabad	1761	50	Mau	3			

Total Districts Available in Uttar Pradesh	75
Total Gov. Districts Libraries Available	70
Total Questionnaire Distributed	70
Total Numbers of Responses	68
Number of Response in %	97.14%

Total Districts Available in Uttar Pradesh	ı 75
Total Gov. Districts Libraries Available	70
Total Questionnaire Distributed	70

Total Numbers of Responses	68
Number of Response in %	97.14%

In order to identify the status of libraries registered users in district libraries researcher asked a question to the respondents and concluded their result in a form table no 05 shows the actual status of libraries users in 21<sup>at</sup> century. Table no.05 shows that the districts Kannoj, Balrampur and Bagpat did not have any registered users at the time was data received. In this order researcher also concluded that the following district libraries have lowest registered users from 1 to 80 only, these districts libraries are (Smallest to Largest) Mau, Sankabirnagar, Chitrkoot, Amroha, Khusinagar, Noida, Maharajganj, Mahoba, Hathras, Saharanpur. Ambedkar Nagar, Shrawasti and Pilibhit.Top 10 district libraries according to their maximum registered users were found between 1053 to 6000 theses libraries are (Largest to Smallest) 1 Meerut, 2 Gorakhpur, 3 Kanpur Nagar, 4 Agra, 5 Faizabad, 6 Lakhimpur, 7 Unnao, 8 Azamgarh, 9 Sitapur and last 10 Jhansi, and rest of 39 district libraries has their registered users between 142 to 992.



Library Fee in Government District Libraries

Fig. 5:

In order to know the status of library fee in government district libraries figure 05 shows that 5 (7.35%) district libraries had not any provision of library fee for the users; only 1(1.47%) district library had charged library fee between 1 to 100 rupees; 12 (17.64%) libraries had charged library fee between 101 to 200 rupees; 17(25%) libraries had charged their fee between 201 to 300 rupees; 5 (7.35%) libraries accused their library fee between 301 to 400 rupees. The highest numbers of libraries had charged library fee from 401 to 500 rupees; and last 5 (7.35%) of libraries had accused library fee more than 501 rupees. Thus it is clear that maximum numbers of libraries 23(33.82%) had charged their library fee between 401 to 500 rupees.

Table	6:
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Part C: Library Collection and Servic	ces
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#### Status of Library Collection

In order to identify the status of library collection of government district libraries in U.P an alphabetical arrangement has been done according to the name of districts. The detail collections of government district libraries are given in figure 07 Out of 70 (100%) government district libraries, 68 (97.14%) response received for this question. The highest collection of government district libraries have been received between 60,000 to 40,000 (Aprox) these libraries are given below (Largest to Smallest).

Rank	District Library	Highest Collection (Apro.)	Rank	District Library	Highest Collection (Apro.)
1	Unnao District Library	60000	7	Meerut District Library	45000
2	Aligarh District Library	55000	8	Jhansi District Library	45000
3	Bahraich District Library	55000	9	Gorakhpur District	45000
	-			Library	
4	Kanpur District Library	55000	10	Jalaun District Library	40,000
5	Mathura District Library	53000	11	Lucknow District Library	40000
6	Faizabad District	50000	12	Raebareli District Library	40,000
	Library				
	-		13	Varanasi District Library	40000

**Note:** The following data collected for library collection were in approximate value.

In order to know the status of library services provided by the government district libraries of Uttar Pradesh figure 07 shows that all of 68 (100%) district libraries 66(97.05%) libraries were providing circulation services for their users and rest of 2 (2.94%) libraries namely Kannoj and Bagpat government district libraries were not providing circulation services to the users. In the context of Reference services study depicts that 57 (83.82%) libraries were offering the this facility. On the basis of figure it can be observed that 47(69.11%) government district libraries were providing the facility of Reprography services to the users.

#### **Current Awareness Services**

out of 68(100%) respondents, just 17 (25%) districts libraries were providing general current awareness services to the users. Extension Services: as the result shows that merely 07(10.29%) government district



Status of Library Collection of Government District Libraries of Uttar Pradesh

-----Status of Library Collection



Status of Library Services





Fig. 7:

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libraries of Uttar Pradesh provide that facility to the local audiences in some special occasion of library and information science. Inter Library Lone Facility: it is one of the interactive facilities provided by the libraries that can explore the library services beyond the wall. In this context only 5 (7.35%) government district libraries of Uttar Pradesh afford this services these libraries were Lakhimpur, Unnao, Firozabad, Mathura and Lucknow districts libraries.

Part D-Status of ICT Infrastructure and Application

Status of Computers Available in Government District Libraries



Fig. 8:

On the basis of above figure 08 result found that, out of 68 (100%) served libraries 35 (51.47%) districts libraries have 4 to 6 numbers of Computers which was the highest rate of availability of computers in libraries then followed by 24 (35.29%) libraries have 7 to 9 numbers of personal computers. The result depicts that only 1 (1.47%) library namely Unnao government district library have 11 computers. 5 (7.35%) District libraries have possess minimum numbers of computers between 1 to 3. At the last, study shows that out of 68(100%) district libraries 3 (4.41%) libraries do not have computers facility these libraries are Auraiya, Ambedkar Nagar and Bagpat district Libraries.

Availability of ICT Equipment in Government District Libraries

Table 6:

S. No.	Equipment	No. of Libraries Have, N=68 (100%)	Percentage %
1	Photocopier	56	81.35%
2	Fax Machine	00	00
3	Scanner	53	77.94%
4	O.C.R	00	00
5	Projector	06	8.82%
6	Printer	57	83.82%
7	VCR/LCD/LED	50	73.52%
8	Telephone	50	73.52%
9	AnyOther	-	

On the basis of collected data table 06 shows the status of ICT equipments available in Government District Libraries. The data concluded that 56 (81.35%) libraries have a facility of Photocopier machine. The study indicates that not any government district libraries of Uttar Pradesh encompass a facility of fax machine. In the context of the Scanner Machine 53 (77.94%) district libraries of Uttar Pradesh have this facility. The result shows that only 6(8.82%)libraries have Projector facility out of 68 (100%) libraries. In the context of Printer, study indicates that 57 (83.82%) district libraries have this facility and they are using that facility for officially but sometimes they used to provide reprography services to the users. On the basis of the obtained data result shows that 50 (73.52%) libraries have

LCD/LED facility. In the context of telephone facility, which is one of the basic requirement for communication the result shows that 50 (73.52%) district libraries have that facility out of 68 (100%) of libraries.

Status of Internet Accessibility in Government District Libraries







In order to know the status of internet accessibility in government district libraries result shows that out of 68 (100%) district libraries 51 (75.00%) libraries have their own internet connection and rest of 17 (25.00%) libraries did not have internet facility. The figure 09 depicts that out of 68 (100%) of libraries only 43 (63.23%) libraries provide internet accessibility facility to local users without any cost.

*Type of Internet Connectivity* 



Figure no 10 shows that out of 51(100%) respondents 34(66.66%) libraries have Broadband internet facility and they are not offering Wi-Fi connectivity to the users. Only 17 (33.33%) libraries

were providing Wi-Fi facility to the users out of 51 (100%) district libraries.

#### Status of Website of Government District Libraries

Avaailability of the District Library Website





In order to identify the status of district libraries websites the following figure 11 shows that out of 68 (100%) library only 2 (2.94%) libraries have its own district website these libraries are Unnao and Kanpur Nagar Government District libraries. Rests of all 66 (97.05%) libraries do not have library websites.

Use of ICT Application/Technologies in Government District Libraries

Table 7:

S. No	Services Through ICT	No of Respondents (N=64)	Percentage
1	RFID Technology	00	00
2	Claude Computing	00	00
3	Mobile Technology	00	00
4	Bar Code Circulation Services	00	00
5	Digital Library Facility	01	1.47%
6	OPAC	00	00
7	Union Catalogue	00	00
8	Email inquiry	28	41.17%
9	Promotion through Social Media	05	7.35%
10	Library Portal	01	1.47%
11	Using Library Forum	03	4.41%
12	Online Resources Sharing	00	00
13	DDS Services	00	00
14	E-journal / Books etc.	00	00
15	CC TV	00	00
16	Any Other	00	00

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In order to find out the status of ICT application used by the Government Districts Libraries of Uttar Pradesh. Research asked following questions to the respondents regarding to the ICT Application/ Technology and simplify their conclusion in a form of Table. Table 7 depicts that only few libraries were using some ICT application in theirs libraries. These ICT applications were Email Inquiry, Digital Library Facility, Library Promotion through Social Media, Facility of Library Portal and Use of Library Forum. The details about these facilities are given in above table no 08. None of any government district libraries of Uttar Pradesh were using any of the following ICT application these applications are RFID Technology, Claude Computing, Mobile Technology, Bar Code Circulation Services, OPAC, Union Catalogue Facility, Online Resources Sharing, DDS Services, Ejournal / Books / Database, CC TV or any other ICT Application/ Technology.

Status of Satisfaction towards ICT facility of Libraries



To know the status of Satisfaction towards the ICT facilities provided by the government district libraries of Uttar Pradesh figure 12 shows that out of 68 (100%) libraries only Unnao district library were satisfied with their ICT facilities and rest of 67 (98.52%) district

libraries were not satisfied with ICT facilities.

Status of Library Automation of Government District Libraries

Table 8:

S. No.	Status of Library Automation	No of Respondents,(N=68)	Percentage %
1	Fully Automated	00	00
2	Partially Automated	00	00
3	Under Automated	09	13.23%

In order to know the status of library automation researcher distributed 68 (100%) questionnaires to the respondents and received 68 (100%) responses for that question. On the basis of responses result shows that only 09(13.23%) district libraries of Uttar Pradesh were under the stage of library automation and rest of all libraries were updating for library automation under the state government project of E-Library.

**Note: 2-** Uttar Pradesh state government has introduced E-Library plan with the worth of 6,31,83,000.00 rupees , for the execution of the E - Library plan state government has tie up with BSN InfoTech with the grand support of National Information Center. BSN InfoTech, Lucknow branch has appointed at least 3 contractual appointments for the development of E-Library in every district libraries namely 1 District Coordinator with the worth of aprox 17,000.00 rupees pm, 1 Computer Operator with worth of aprox. 7,000.00 rupees pm. All of

these contractual appointments are presently working in district libraries of Uttar Pradesh from mid year of 2014 to till date, but the question is arrived that why BSN InfoTech has not appointed library professionals as contractual appointments for the construction of E-Library in entire state. Because at the time of entire study, researcher observed that none of any contractual appointment persons have any single Degree or Certificate of Library and Information Science, who are working in government district libraries of Uttar Pradesh.

For that you can imagine how they can maintain libraries works when they don't have any idea about the terminology of library and how they can work for the development of E- Library, how is it.

It was also examined by the researcher thatBSN InfoTech had not been published any advertisements for the post of contractual appointment in public libraries of Uttar Pradesh. It does clearly mean that there have not any transparences in E-Library project.

S. No	Type of Software	No of Respondents N=9 (100%)
1	Open Sources Software	9 (100%)
2	Commercial Software	00
3	Any others	00

Status of Library Automated Software

In order to indentify the status of library automation software use in district libraries of Uttar Pradesh the result shows that out of 68 (100%) district libraries only 9 (13.23%) libraries were under the stage of library automation. Table 9 shows that all of 9 libraries were using open sources library software. All 9 (100%) libraries were using E-Granthalaya Library software except Unnao government district library which was using Koha library Management software but still Unnao government district library was going to change Koha library software by E-Granthalaya.

\*Note: All of 9 libraries were under the stage of library automation and fully satisfies with E-Ghrathalaya Library Management Software.

#### Part E: Library Infrastructure

Status of Library Building

Table 10:



In order to know the status of library building of government district libraries of Uttar Pradesh Figure 13 concluded that 59 (83.76%) district libraries have it own separate permanent library buildings out of 68(100%) libraries and rest of 9 (13.23%) district libraries did not have it own permanent library buildings. All of these district libraries were giving their facility in on-lone buildings; most of these libraries were situated in G.I.C campus or any other Inter collages of particular district.

Status of Library Resources and Infrastructure

S. No	Infrastructure Facility N= 68 (100%)	Yes	No	Percentage Value/Yes	Remark
1	Have Proper Space	52	16	76.47%	
2	Have Separate Reading Room	52	16	76.47%	
3	Have Back -Up Electricity Plan	52	16	76.47%	Need Transformer
4	Proper Seating Arrangement	53	15	77.94%	
5	Ac/Cooler facility	49	19	72.05%	Only Cooler Avi.
6	Stander Library Furniture Facility	52	16	76.47%	Need Stn. Furni.
7	Have Catalogue cabinet	35	33	51.47%	
8	Separate Stack Room	47	21	69.11%	
9	Have Children Section Facility	34	34	50%	
	-				

In order to identify the status of library infrastructure, respondents were asked to mention their views. Table 10 reveals that out of 68 (100%) district libraries 52 (76.47%) libraries have proper space in their libraries buildings but 16 (23.52%) libraries have not proper space in their buildings, theses libraries are Lalitpur, Auraiya, Bagpat, Sharanpur, Shahjahanpur, Ambedkar nagar, Amethi, Gonda, Chandauli, Mau, Santkabirnagar, Khusinagar, Kannoj, Balrampur and Mohaba district libraries. In the context of separate reading room facility result depicts that 52 (76.47%) libraries have separate reading room facility in libraries. Back- UP Electricity Plan; Researcher asked to the respondents about the back- up facility of electricity. The result shows that 52(76.47%) libraries have back- up electricity facility through invertors but investors are not sufficient across the library so respondents have request to state government for the facility of Generator in libraries. Seating Arrangement; In the context of seating arrangement table 10 demonstrate that 53 (77.94%) libraries have proper seating arrangement. Ac/ Cooler Facility; To study the status of Cooler and Ac facility in a libraries Table 10 shows that 49 (72.05%) libraries have Cooler facility but the facility are restricted to-words libraries staffs only not for their users. Standard Furniture facility; The result concluded that only 52 (76.47%) libraries have proper furniture but all they were requesting for new and well standers furniture's in libraries. Catalogue Cabinet facility; The facility of catalogue is a key of any successes full library but it is very critical situation for the district libraries of Uttar Pradesh that only 35(51.47%) libraries have a facility of catalogue cabinet and the rest of 33 (48.52%) libraries have not that facility.

#### Separate Stack Room

In the context of separate stack room facility the result shows that 47(69.11%) libraries have separate stack room facility and rest of 21(30.88%) district libraries have not this facility.

Children Section facility; It is one of the essential facility of government district libraries which are also mention in public library act of Uttar Pradesh, that there should be a separate child section in every public library but the result shows that 34 (50%) libraries have children section facility, and rest of 34 (50%) district libraries have not children section facility in there libraries.

Status of Satisfaction towards the Physical Facility of Government District Libraries

# Status of satisfaction towards the Physical Facility



To know the satisfaction rate of the respondents towards physical facility only 24 (35.29%) library were satisfied with physical facility but majority of 44 (64.70%) district libraries were not satisfied with their physical facility out of 68(100%) respondents. All these libraries were demanding following facility in libraries are given below;

- Need Small Construction and Proper Building Maintenance,
- Proper water solution facility.
- Proper Electricity backup facility
- Requirement of at least one Sweeper for library, because all sweepers are attached with DIOS office.
- Require Disaster Mitigation Facility.
- Require at least one Guard facility in night.

#### Part D: Library Budget

Status of Overall Satisfaction with Library Budget



The overall satisfaction rate about the library budget received by the librarian/ library in-charge depicts that 62 (91.17%) respondents of government district libraries were not satisfied with library budget only 06 (8.82%) district libraries were satisfied with their library budget. It implies that the maximum numbers of district libraries respondents were not satisfied with library budget.

Status of Satisfaction with Governance



Figure 16 shows that out of 68 (100%) government district libraries of Uttar Pradesh 66 (97.05%) respondents were satisfied with governance of government district libraries but all they were strictly demanding that the role of DIOS towards the district libraries should be ended and librarian should be directly responsible for OSD or other higher authority of district libraries. Another request of the respondents to the Government of Uttar Pradesh was to recruit more permanent staffs in libraries. Only 2 (2.95%) district libraries were not satisfied with the governance of district libraries.

# Weak Areas of District Libraries

#### Table 11:

S. No	Weak Area	No of Responses, N= 68(100%)	Percentage Value
1	Building Maintenance	57	83.82%
2	Contingency Amount	58	85.29%
3	Need Separate Building	09	13.23%
4	Other	02	2.94%

In order to know the weak areas of the government district libraries where they were demanding for more

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fund the table 11 concludes that 57 (83.82%) district libraries were demanding more fund for building construction and 85 (85.29%) district libraries were demanding to increase contingency amount of libraries budgets; Only 09 (13.23%) district libraries were required separate library building and 2 (2.94%) district libraries were required more funds for other library facility these libraries were Banda and Pratapgarh.

# **Conclusion & Findings**

The main objective of the study was to investigate the present status of the government district libraries in Uttar Pradesh. This section deals with the findings and conclusion the study. It is an outcome of the data analysis and interpretation of collected data. This section has explored the findings and conclusion through the mathematical, statistical analysis and interpretation of responded data. The findings of the study is very helpful for the decision makers of government district libraries because with the help of this section decision maker can evaluate the performance of government district libraries of Uttar Pradesh and they will work for the betterment of government district libraries in entire state. The different aspect about the status of government district libraries of Uttar Pradesh have been evaluated by the researcher and compiled in the form of findings and conclusion. The major outlines of the findings are given under the diverse headings.

- The study illustrates that out of 75 districts of Uttar Pradesh, 70 districts are providing a facility of government district libraries.
- The golden age for the establishment of government district libraries in Uttar Pradesh were examined between 1981 to 1990 in this period 29 (46.03%) government district libraries were founded.
- The study concluded that majority of the respondents 64 (94.11%) were unsatisfied with their staffs.
- The result depicts that22 (32.35%) district libraries were providing the facility of classification to the users and16 (23.52%) libraries were providing the facility catalogue for the users.
- The highest collection of government district libraries have been received between 60,000 to 40,000 approx.
- The result shows that majority of district libraries 66 (97.05%) were providing circulation facility/ References facility 57 (83.82%) to the users.

- The data concluded that majority of libraries 56 (82.35%) have facility of Photocopier machine, Scanning facility (77.94%), Printer facility (83.82%) & LCD/LED facility (73.52%).
- 75.00% libraries have their own internet connection; whereas 63.23% libraries were providing internet accessibility facility to the local users, free of cost.
- Only 2 (2.94%) libraries have its own district library website these libraries are Unnao and Kanpur Nagar Government District libraries.
- Not any government district libraries of Uttar Pradesh are using any of the following ICT Application/Technology like RFID Technology, Claude Computing, Mobile Technology, Bar Code Circulation Services, OPAC, Union Catalogue Facility, Online Resources Sharing, DDS Services, E-journal / Books / Database, CC TV or any other ICT Application/ Technology.
- The result shows that only 9(13.23%) government district libraries of Uttar Pradesh were under the stage of library automation and rest of all libraries were updating for library automation under the state Government project of E-Library
- Researcher concluded that 59 (83.76%) district libraries have separate permanent library buildings and rests of 9 (13.23%) district libraries do not have permanent library buildings.
- In the context to know the satisfaction rate of the respondents towards physical facility majority of respondents 64.70% were not satisfied with their physical facility.
- 91.17% respondents of government district libraries were not satisfied with their library budgets.

The study has concluded that the status of Government District Libraries of Uttar Pradesh is not satisfactory according to analysis and interpretation of data received by the respondents (Librarian/ Library In-Charge). That's why researcher request to the policy maker and administrator of government district libraries to take a massive decision for the development and modernization of the district libraries because public libraries are a way of success to everyone.

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# Usage of Internet Search Engines among B.Ed Students of Karnataka College of Education, Yadagir: A Study

Basawaraj Malipatil\*, Shashikala S. Angadi\*\*

# Abstract

The present study examined availability and use of internet search among B.Ed. students of **Karnataka College of Education**. Today internet has become a world wide data communication system. The data were collected from the students of KCE the statistical tool used to analyze the data were simple percentage. A good number of respondents are female and common of the users were using and foremost preference to Google search engine followed by Yahoo, Bing and Ask.

Keywords: Internet; Search Engines; Types; Email.

# **Internet Search Engines**

The recent developments in information and communication technology (ICT) have changed the world communication scenario. The internet has become a world data communication system, changing the way of people. Look for information. The internet has brought new forms of social interactions networks and online activities because of its accessibility and availability. Encyclopaedia of Britannica defines Internet is Networks of Networks. It is refers to a huge database of internet resources such as web pages, images, documents, etc., is helps to locate information on World Wide Web. Search engines play a vital role in providing exact or nascent digital information to the users. Search engines are tools for finding classifying and storing information on various websites on the internet. They can help in locating information of relevance on a

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Received on 26.02.2017, Accepted on 04.03.2017

particular subject by using various search methods. Encyclopaedia defines as " a search engine is a computer program, to find answer to queries in collection of information's. A web search engine produces a list of pages, computer files listed on the web that contains the terms in a query". Search engines use computer programs (i.e. Software) called Bots also known as robots, spiders, crawlers, worms, intelligent agents, knowledge bots, or know bots.

# Search Engine Components

Generally there are three basic components of a search engine as listed below:

- 1. *Web Crawler:* it is also known as spider or Bots. It is a software component that traverses the web to gather Information.
- 2. *Database:* all the information on the web is stored in database. It consists of huge web resources.
- 3. *Search Interface:* this component is an interface between user and the database it helps the user to search through the database.

# Objectives of the Study

• This study examines the usage of internet search engines among B.Ed Students of Karnataka College of Education, Yadagir.

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- To know the usage of internet search engines by the B.Ed College students.
- To know purpose of using internet search engines.

#### Methodology

A structured questionnaire was prepared to collect data from B.Ed college students of *Karnataka College of Education, Yadagir* for this purpose of study. A total of 150 questionnaires were distributed among students and 132 filled in questionnaires were received and then data was analyzed, tabulated, interpreted and presented. The response rate is 88.00%.

#### Data Analysis and Interpretation

Table 1 shows that the gender wise distribution among B.Ed. students of Karnataka College of Education found to the distribution of male students 37 (28 %) and female students 95 (72 %).

Table 2 shows out of the selected sample of 132

out of 71 (53.78 %) respondents are 26-30 years followed by 35 (26.51 %) respondents are under age group of below 25 years, 18 (13.63 %) are 31-35 years and only 8 (6.06 %) respondents are above 36 years age group of B.Ed. students of Karnataka College of Education.

It can be observed from the Table 3 that the majority of the respondents frequency of using internet on majority of the respondents 63 (47.72 %) are use twice in a week followed by 38 (28.78 %) are use daily, 22 (16.66 %) are use weekly once and only 9 (6.81 %) of respondents use occasionally.

The above Table 4 shows the daily time spent by the respondents in using internet from the table it can be found that majority of the respondents 73 (53.30 %) are used 1-2 hours followed by 36 (27.27 %) are use 2-3 hours, 17 (12.87 %) are use 0-1 hour and only 6 (4.54 %) of the respondents are use more than 3 hours on internet.

It is evident that from the Table 5 most of the respondents 132 (100 %) replied that all are aware of search engines.

100.00 %

Gender	Respondents	Percentage
Female	95	72 %
Male	37	28 %
total	132	100 %
Table 2: Respondents age g	roup	
Age Group	Respondents	Percentage
Below 25	35	26.51 %
26 - 30	71	53.78 %
31 – 35	18	13.63 %
Above 36	8	6.06 %
Total	132	100.00 %
Frequency of using interpretent of the second sec	ernet	
Frequency	Respondents	Percentage
Daily	38	28.78 %
Twice in a week	63	47.72 %
Weekly once	22	16.66 %
Occasionally	9	6.81 %
Total	132	100.00 %
Table 4: Time Spent on internet	÷	
Time spent	Respondents	Percentage
0 – 1 hour	17	12.87 %
1 – 2 hours	73	55.30 %
2 – 3 hours	36	27.27 %
Above 3 hours	6	4.54 %

132

Table 1: Gender wise Distribution

Total

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The above table 6 shows that to obtain the information from the internet, search engines are main tools as desired by the respondents. Google search engine was the most popular search engine with 132 (100.00 %) followed by yahoo 97 (73.48 %), Bing 77 (58.33 %), Ask 48 (36.36 %), Lycos 47 (35.60 %) and others 36 (27.27 %), Hotbot 31 (23.48 %), Dogpile 29 (21.96 %) and Mamma search engine was use by the respondents are very lowest 18 (13.63 %).

It is observed from the table 7 that the most of the respondents using more than three email accounts. Majority of the respondents using Gmail 132 (100 %) followed by Yahoo mail 83 (62.87 %), Hotmail 65 (49.24 %), Rediff mail 33 (25.00 %) and only 18 (13.63 %) using other email services.

From the Table 8 it is clear that majority of

Table 5: Awareness of search engine

respondents 119 (90.15 %) use for academic and research purpose followed by social networking sites 113 (85.60 %), online shopping 103 (78.03 %), online newspaper reading 92 (69.69 %), other purpose of using search engines are 72 (54.54 %) and 52 (39.39 %) of respondents are use playing games and entertainment purpose.

The Table 9 explains the majority of the respondents are facing major factors affecting while using internet search engines. The above table reveals that out of 132 respondents 57 (43.18 %) find out unstable electricity problem followed by 38 (28.78 %) respondents obtained that Main server problem, 23 (17.42 %) respondents lack of searching skills and 14 (10.60 %) respondents facing other type of factors affecting.

Awareness	Respondents	Percentage
Yes	132	100.00 %
No	0	0.00 %
Total	132	100.00 %
Table 6: Use of Search Engi	nes (Multiple)	
Search Engines	Respondents	Percentage
Ask	48	36.36 %
Bing	77	58.33 %
Dogpile	29	21.96 %
Google	132	100.00 %
Hotbot	31	23.48 %
Lycos	47	35.60 %
Mamma	18	13.63 %
Yahoo	97	73.48 %
Others	36	27.27 %

Table 7: Use of E-mail Service (Multiple)

E-Mail	Respondents	Percentage
Gmail	132	100.00 %
Yahoo Mail	83	62.87 %
Hotmail	65	49.24 %
Rediff Mail	33	25.00 %
Others	18	13.63 %

Table 8: Purpose of using Search Engines (Multiple)

Purpose	Respondents	Percentage
For Academic	119	90.15 %
For online shopping	103	78.03 %
Online reading	92	69.69 %
Using social networks	113	85.60 %
Playing games	52	39.39 %
others	72	54.54 %

Table 9: Factors affecting for Internet Search Engines

Factors	Respondents	Percentage
Server down	38	28.78 %
Unstable electricity	57	43.18 %
Lack of search skills	23	17.42 %
Others	14	10.60 %
Total	132	100.00 %

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#### Findings

- Out of the 132 respondents surveyed 95 (72 %) are Female and about 37 (28 %) are Male.
- 71 (53.78 %) respondents belong to the age group between 26-30 years.
- 63 (53.78 %) of respondents use internet search engines are Twice in a week.
- Out of 73 (55.30 %) respondents spent on internet search engines are 1-2 hours daily.
- A majority of respondents were using Google search engine which is most popular search engine for B.Ed. students of KCE.
- Majority of the respondents are using more than three email accounts and using it. Gmail is familiar email provider for this study.
- 119 (90.15 %) of respondents are mainly using for Academic and Teaching purpose.

#### Conclusion

In conclusion, this study has show that the number of search engines are use in world wide web that are know to users are very few and his will present access to use it. The present study students are concentrated and used to few search engines like, Google, Yahoo and Bing, while others internet search engines are unfamiliar with users. Therefore, most practical aspects of search engines should be employed to promote greater awareness needed to improve the usage of search engines and students are faced with numerous problems from the use of search engines.

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# Research Impact of Human DNA in USA: A Scientometric Analysis

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#### Abstract

Scientometric analysis of human DNA research output of the USA has been studied from 7264 research papers published during 1984-2012 that indexed in *Scopus*. The study reveals that the highest number of 337 papers or 4.64% published in 1996, followed by 314 (4.32%) papers in 1999. According to the Relative Growth Rate and Doubling Time of the publications value measured from 0.03 in 2010 and 2011 to 0.087 in 1985; from 0.80 in 1985 to 23.10 in 2010 and 2011 respectively found in this study. Among the document types, journal articles were the highest numbers with 7210 papers or 99.26%. From this study, it is observed that the *Journal of Biological Chemistry* has published with 529 research papers and find top position which is accounted for 7.28% of the total articles. Among 128 institutions, the National Cancer Institute has published 322 papers or 4.43% during the study period. It is found that the degree of Collaboration of authors from 0.99 in 2003 to 0.66 in 2010 to which is to be fluctuating trend appears during the study period. Overall, there is an increasing trend has been identified on multi authored papers in human DNA research by the US during the period. In this study, it is found that 29% papers are internationally, collaboration and UK is the major collaborator with the USA in 270 papers.

**Keywords:** Human DNA; Genetic; Degree of Collaboration; Relative Growth Rate; Doubling Time; Scientometric Analysis; USA.

#### Introduction

DNA, or deoxyribonucleic acid, is the hereditary material in humans and almost all other organisms. It is a macromolecule with a double helical structure, built up from four types of nucleotides, each of them containing a sugar, a phosphate group (making up the DNA backbone) and a nucleobase. DNA was first discovered by a Swiss Physician Dr. Friedrich Miescher in 1869. Then its double helical structure was discovered in 1953, by Iames Watson and Francis Crick. Ever since the discovery of DNA structure, it continues to make great advancement in understanding the human genome

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Received on 14.02.2017, Accepted on 23.02.2017

and the importance of DNA to life and health. There are only four nucleobases in the DNA structure: Adenine (A), Guanine (G), Cytosine (C) and Thymine (T) Cardos [6] et al., 2008. The human genome is subdivided into a large nuclear genome with more than 26,000 genes, and a very small circular mitochondrial genome with only 37 genes. The nuclear genome is distributed between 24 linear DNA molecules, one for each of the 24 different types of human chromosome (Organization of the Human Genome). The human genome holds an extraordinary trove of information about human development, physiology, medicine and evolution. Lander E.S [10] et. al., 2001. The modern history of DNA sequencing began in 1977, when Sanger reported his method for determining the order of nucleotides of DNA using Chain - terminating analogs. Sager, F [16] et al., 1977. DNA isn't just about growth. It instructs cells throughout your life – telling them how to respond to the foods you eat, the germs you encounter and the pollutants to which you are exposed. Ultimately, DNA even influences how you age. Genetic tests also are available to help couples learn if they carry genetic mutations for rare diseases and if they are

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likely to have a child affected by the disease. National Human Genome Research Institute [13].

#### **Review of Literature**

Baskaran, C [4]. 2013, conducted a study on Research Productivity of Alagappa University during 1999-2011 and found that the multi-authored papers are in higher numbers (750; 96.64%) than single authored papers (26; 3.35 %). Gupta B.M [8,9] et al, 2013, have studied the global publication output of cataract research during 2002-2011 and found that the world publication output of cataract research consisted of 27,053 papers during 2002-2011, which increased from 2,025 papers in 2002 to 3,080 papers in 2011, witnessing an annual average growth rate of 4.89%. The average citation impact per paper registered by world publications was 6.94 during 2002-11, which decreased from 7.82 during 2002-06 to 5.21 during 2007-11. G. Cantos-Mateos<sup>5</sup> et al. 2012 have studied an overview of stem cell research by Spanish and found the main areas of research. Bibliometric indicators are used for basic nature as well as techniques for the visualization and analysis of networks of scientific information. Gupta, B. M. [8,9] et al 2011 have analysed the research output of typhoid research in India during 2000-2009. They have identified its growth, rank and global publications share, citation impact, share of international collaborative papers, contribution of major collaborative partner countries, and the contribution of various subject fields and patterns of research communication in most productive journals. Pratap. G and Gupta B.M [15] 2011 studied the performance of education and research institutes in India in medical and allied sciences during 1999-2008. The data were collected from the Scopus database and a new composite performance indicator. Garg, K.C, [7] et al. 2010 revealed that most of the papers published by Indian scientists dealt with molecular genetics relating to organisms of humans, plants and animals, and academic institutions published the highest number of papers. However the value of Relative Citation Impact (RCI) for academic institutions was lesser. Molatudi, M and Pouris, A [12] 2006, examined the status of microbiology and molecular biology and genetics research in South Africa. Bibliometric analysis of medical informatics literature has been made by Sundari B.S [19] et al 2004, and discussed in authorship pattern, collaboration index, degree of collaboration, collaborative coefficient and country wise production. Srivatsava, D [17] 2004 discussed on the concept of collaboration and the methodology in research collaboration in the field of biomedical sciences in India. Almeida-Filho [1] et al. 2003 conducted a bibliometric and content analysis of research on health inequalities produced in Latin American and Caribbean countries. The study found that, recent rapid growth in overall output. Brazil, Chile, and Mexico contributed mostly empirical research, while Ecuador and Argentina produced more conceptual studies. Arunachalam and Gunasekaran [2,3] 2002a, 2002b have mapped tuberculosis and diabetes research carried out in India and China based on the data collected from three different databases.

#### **Objectives**

The objectives of the study are:

- 1. To measure the growth of Human DNA research literature
- 2. To analyze pre Relative Growth Rate (RGR) and Doubling Time (DT) of DNA Research Outpuut
- 3. To analyze the degree of collaboration
- 4. To analyze the document type wise distribution
- 5. To observe most collaborating countries with the USA.
- 6. To examine most productivity authors.

#### Methodology

The bibliographic data on human DNA research carried out in the USA has been collected from the *Scopus* database for the publication year 1984 -2012. The keyword 'human DNA' was used in the Title and Keyword fields to collect publication data pertaining to human DNA. Further, the search results fall under the two subject areas viz. "Life Sciences" and "Health Sciences" were refined.

The country 'United States' was used in the affiliation field. Finally, data set of 7,264 publications was retrieved and analyzed using MS-Excel as per objectives of the study. Moreover, the relative growth rates (RGR) and the doubling time (DT) have been studied as suggested by Mahapatra (1985). The degree of collaboration proposed has also been studied as proposed by Subramanyam (1983). We have identified the top productive authors and top institutions in USA in human DNA research. We have also identified the top collaborative countries with the USA. Impact factor values of journals have been assigned from the *Journal Citation Reports (JCR)* 2012.

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#### Limitations

This study is based on the bibliographic data available in the database and restricted to the study period. Some relevant bibliographic data may be missed out.

#### Data Analysis

This study discusses the human DNA research carried out in the USA and brought out the following findings.

#### • Relative Growth Rate (RGR)

The overall Relative Growth Rate is the increasing in the number of publications/pages per unit of time. The unit of time is calculated based on one year. The mean relative growth rate R (1-2) over a specified period of interval can be calculated from the following equation suggested by Mahapatra (1985).

Where,

R = Mean relative growth rate over the specific period of interval

 $W_1 = \log W_1$  (Natural log of initial number of publications/ pages)

 $W_2 = \log W_2$  (Natural log of initial number of publications/pages)

 $T_2$ - $T_1$  = Unit difference between the initial time and final time.

Therefore,

R (a) = Relative growth rate per unit of publications and per unit of time (year)

R (p) = Relative growth rate per unit of pages and per unit of time (year)

Doubling Time

A direct equivalence exists between the relative growth rate and doubling time. If the number of publications/pages on a subject doubles during a given period, then the difference between the logarithms of the numbers at the beginning and at the end of the period must be the logarithms of the number 2. This difference has a value of 0.693. Thus, the corresponding doubling time for publication, and pages can be calculated by the following formula:

$$\begin{array}{l} 0.693\\ \text{Doubling time (Dt)} = - - - - - \\ R \end{array}$$

Therefore,

Do

$$0.693$$
  
ubling time for publications Dt (a) =  $- - - R$  (a)

#### Degree of Author's Collaboration

The formula proposed by Subramanyam (1983) has been used to identify the degree of collaboration of authors as below.

Nm

Nm+Ns

Where,

C = Degree of collaboration in a discipline

Nm = Number of multi-authored papers in the discipline

Ns = Number of single-authored papers in the discipline



Fig. 1: Distribution of human DNA research papers published in USA during 1984-2012

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The distribution of human DNA research papers published in the United States of America is shown in Figure 1. The highest number of papers (337) published in the year 1996 during the study period, which is accounted for 4.64%, followed by 314 papers in 1999 with 4.32% and 293 papers (4.03%) in 1991. On the other hand, 1984, 2011 and 1987 are the years with lower productivity with 160, 196 and 201 papers respectively published by the American scientists on human DNA research. There is a fluctuating trend has been shown in publication productivity during the study period.

Moreover, there are nine document types were classified as given in the database viz. article, review, conference paper, note, letter, short survey, erratum, editorial and book chapter. The major chunk from article 6743 or 92.83% were classified under journal article. Followed by review with 208 and conference papers with 180 papers were classified. Other six document types were collectively had 133 papers or 1.83%. All document types were considered for this study.

Table 1: Relative Growth Rate and Doubling Time of publication productivity during 1984-2012

Sl. No	Year	No. of papers	Cumulative No. of papers	<b>W</b> <sub>1</sub>	<b>W</b> <sub>2</sub>	R (a)	Mean (a) 1-2	Doubling Time	Mean dt (a) 1-2
1	1984	160	160	-	5.07	-	-	-	-
2	1985	222	382	5.07	5.94	0.87	-	0.80	-
3	1986	199	581	5.94	6.36	0.42	-	1.65	-
4	1987	201	782	6.36	6.66	0.3	-	2.31	-
5	1988	202	984	6.66	6.89	0.23	-	3.01	-
6	1989	224	1208	6.89	7.09	0.2	-	3.47	-
7	1990	249	1457	7.09	7.28	0.19	-	3.65	-
8	1991	293	1750	7.28	7.46	0.18	-	3.85	-
9	1992	253	2003	7.46	7.6	0.14	-	4.95	-
10	1993	270	2273	7.6	7.72	0.12	-	5.77	-
11	1994	265	2538	7.72	7.83	0.11	-	6.30	-
12	1995	291	2829	7.83	7.94	0.11	-	6.30	-
13	1996	337	3166	7.94	8.06	0.12	-	5.77	-
14	1997	291	3457	8.06	8.14	0.08	-	8.66	-
15	1998	271	3728	8.14	8.22	0.08	0.22	8.66	4.65
16	1999	314	4042	8.22	8.3	0.08	-	8.66	-
17	2000	261	4303	8.3	8.36	0.06	-	11.55	-
18	2001	255	4558	8.36	8.42	0.06	-	11.55	-
19	2002	262	4820	8.42	8.48	0.06	-	11.55	-
20	2003	262	5082	8.48	8.53	0.05	-	13.86	-
21	2004	263	5345	8.53	8.58	0.05	-	13.86	-
22	2005	259	5604	8.58	8.63	0.05	-	13.86	-
23	2006	251	5855	8.63	8.67	0.04	-	17.33	-
24	2007	245	6100	8.67	8.71	0.04	-	17.32	-
25	2008	223	6323	8.71	8.75	0.04	-	17.33	-
26	2009	257	6580	8.75	8.79	0.04	-	17.33	-
27	2010	224	6804	8.79	8.82	0.03	-	23.10	-
28	2011	196	7000	8.82	8.85	0.03	-	23.10	-
29	2012	264	7264	8.85	8.89	0.04	0.04	17.32	15.55
	Total	7264	-	-	-	3.82	0.13	10.10	10.1

The Relative Growth Rate (RGR) and Doubling Time (DT) of research productivity on human DNA research papers published by US scientists are shown in table 1. It is apparent that the Relative Growth Rate trend has been fluctuating as 0.87 in 1984 and 0.04 in 2012. The mean relative growth rate (mean RGT) 0.22 has been recorded during the period 1984-1998. Similarly, the mean RGT 0.04 has been found during 1999-2012. It is found that the overall mean RGT 0.13 recorded during the study period. There has been an increasing trend on human DNA research papers in terms of doubling time rose from 0.80 in 1984 to 17.32 in 2012. From this study it is clearly found that the mean doubling time (mean DT) for publication as 24.48 years. Moreover, the mean doubling time for the period 1984-1998 is 4.65 years and 15.55 years for the period 1999 to 2012. The doubling time mean value 10.1 has been identified during the study period 1984-2012.

#### Degree of Collaboration

Table 2 presents the year wise distribution of a single author and multi-authored articles and their

degree of collaboration. In this study, the degree of collaboration of the years (1984 -2012) is almost same of the mean value as 0.91 (i.e. 91% papers collaborative papers). Out of 7264 papers, 6631 were published by more than one author (accounted for 91.3%) and 633 papers or 8.71% are published by a single author. Overall, there is an increasing trend has been identified on multi authored papers in human DNA research by the US during the period. The highest

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degree of collaboration 0.99 has been recorded in the year 2003. In the years 1997, 1998 and 2004 the degree of collaboration 0.98 has been recorded. The highest number of multi-authored papers published in 1996 and 1999, with 323 and 304 respectively. On the other hand, there is a fluctuating trend of single authored articles during the period. The largest number of single authored papers 76 was published in 2010, followed by 65 papers in 2012 and 61 papers in 2009.

Year	No of papers	Single author (No. of papers)	Multiple authors (No. of papers)	Degree of collaboration
1984	160	11	149	0.93
1985	222	15	207	0.93
1986	199	8	191	0.96
1987	201	6	195	0.97
1988	202	16	186	0.92
1989	224	14	210	0.94
1990	249	11	238	0.96
1991	293	12	281	0.96
1992	253	8	245	0.97
1993	270	12	258	0.96
1994	265	8	257	0.97
1995	291	13	278	0.96
1996	337	14	323	0.96
1997	291	6	285	0.98
1998	271	5	266	0.98
1999	314	10	304	0.97
2000	261	8	253	0.97
2001	255	9	246	0.96
2002	262	7	255	0.97
2003	262	2	260	0.99
2004	263	5	258	0.98
2005	259	7	252	0.97
2006	251	56	195	0.78
2007	245	49	196	0.80
2008	223	59	164	0.74
2009	257	61	196	0.76
2010	224	76	148	0.66
2011	196	60	136	0.69
2012	264	65	199	0.75
Total	7264	633	6631	0.91

Table 2: Distribution of the degree of collaboration in human DNA research papers published by US scientists during 1984-2012

Table 3: Distribution of human DNA research papers published from USA by journals\*

S. No.	Journal	Journal country	ISSN	EISSN	Impact factor 2012	No. of papers	Percentage to total 7264
1	Journal of Biological Chemistry	US	0021-9258	1083-351X	4.651	529	7.28
2	Cancer Research	US	0008-5472	1538-7445	8.65	356	4.90
3	Proceedings of the National Academy of Sciences of the USA	US	0027-8424	1091-6490	9.737	356	4.90
4	Nucleic Acids Research	UK	0305-1048	1362-4962	8.278	307	4.23
5	Journal of Virology	US	0022-538X	1098-5514	5.076	306	4.21
6	Biochemistry	US	0006-2960		3.377	243	3.35
7	Molecular and Cellular Biology	US	0270-7306	1098-5549	5.372	165	2.27
8	Carcinogenesis	US	0143-3334	1460-2180	5.635	148	2.04
9	Genomics	US	0888-7543		3.01	115	1.58
10	Journal of Clinical Microbiology	US	0095-1137	1098-660X	4.068	87	1.20

\* top ten journals are listed.

The human DNA research papers of the USA were published in four document sources as indexed in the database viz. journals, book series, conference proceedings and books. The major papers were published in journals with 7210 (99.26 %). The other three source types, viz. Book series have 45 (0.62%), conference proceedings 5 (0.07%), and books with 4 (0.06%) papers in DNA research by the USA Scientists. The distribution of human DNA research papers published from USA in top journals is given in table 3. About 36% of papers were published in the top ten journals. *Journal of Biological Chemistry* ranked top in the list with 529 papers or 7.28%, followed by *Cancer Research* and *Proceedings of the National Academy of Sciences of the USA* with 356 papers (4.90%) each. *Nucleic Acids Research* has published 307 (4.23%) papers and *Journal of Virology* has published 306 (4.21%) papers. On the other hand, *Journal of Clinical Microbiology* finds tenth place in the list with 87 (1.20%) papers during 1984 to 2012.

Sl. No.	Institution	No. of papers	Percentage of 7264
1	National Cancer Institute	322	4.43
2	Harvard Medical School	150	2.06
3	UT Medical Branch at Galveston	141	1.94
4	University of Washington Seattle	140	1.93
5	National Institute of Environmental Health Sciences	139	1.91
6	University of Texas M. D. Anderson Cancer Center	136	1.87
7	The University of North Carolina at Chapel Hill	133	1.83
8	University of California, San Francisco	127	1.75
9	Baylor College of Medicine	116	1.60
10	VA Medical Center	95	1.31

Table 4: Distribution of human DNA research papers from USA by institutions\*

\*Only top ten institutions are given in this table

It is found that 258 institutions involved in human DNA research in USA during the period. Distribution of human DNA research papers from USA by institutions are shown in Table 4. The top ten institutions have collectively published 1499 papers, which is accounted for 20% of the total publications. National Cancer Institute of NIH, Bethesda occupies the top of the list with 322 papers or 4.43% in DNA research. The other eight institutions have published over 100 papers each during the period. VA Medical Center has published 95 papers with 1.31% in Human DAN research during the period.

S1. No. Country No. of papers Percentage to 7264 1 UK 270 3.72 2 202 2.78 Japan 3 Germany 196 2.70 4 France 159 2.19 5 158 2.18 Canada Italy 124 1.71 6 7 95 China 1.31 8 Spain 74 1.02 9 South Korea 0.91 66 10 The Netherlands 53 0.73

Table 5: Countries collaborating with USA in human DAN research

\*Only top ten countries are listed

Out of 7264 papers, 2111 have published with international collaboration from 72 countries which is accounted for 29%. Top ten countries collaborating with USA in human DNA research during 1984-2012 are shown in Table 5. The US scientists have collaborated in 270 papers (3.72%) with scientists in the United Kingdom, followed by Japan with 202 (2.78%) papers. Apart from the UK and Japan, the other four countries viz. Germany, France, Canada and Italy have collaborated in 196, 159, 158 and 124 papers respectively. China, Spain, South Korea and the Netherlands have collaborated in 95, 74, 66 and 53 papers respectively during the period. The recent National Science Foundation (NSF) report indicates that the percentage of internationally collaborative articles in all of science rose from 16% to 25% between 1997 and 2012 in the USA. [NSF report on S&E Indicators 2014] The report also reveals that the relatively high rates of international collaboration have been recorded for Geosciences, computer sciences, mathematics, physics, and biological sciences in the range of 27%-37% during 1997-2012.

Sl. No.	Name	No. of Papers	Percentage to 7264
1	Prakash, S.	52	0.72
2	Prakash, L.	50	0.69
3	Pegg, A.E.	47	0.65
4	Kunkel, T.A.	44	0.61
5	Mitra, S.	43	0.59
6	Bohr, V.A.	41	0.56
7	Wilson, S.H.	36	0.50
8	Pommier, Y.	35	0.48
9	Copeland, W.C.	35	0.48
10	Brent, T.P.	35	0.48

Table 6: The authors contributing to human DNA research in the USA

\*Only top ten authors are given

1242 authors have contributed to human DNA research in USA during the period. The top ten prolific authors in human DNA research in the USA are shown in table 6. Prakash, S. and Prakash, L both from the University of Texas Med Branch, Galveston, have published more than 50 papers during the period. Pegg, A.E., Kunkel, T.A., Mitra, S. and Bohr, V.A., have published 47; 44; 43 and 41 papers respectively during the period.

#### Conclusion

Research is evaluated by so many criteria and tools. Bibliometric analysis is one among the tools to measure scientific productivity in terms of quantity as well as quality. This bibliometric study of human DNA research done in the USA reveals that there has been an upward and downward trend shown in research publications during the study period. The mean value of 10.10 Doubling Time (DT) and the value of 3.82 Relative Growth Rate (RGR) are recorded during the period. Overall, there has been an increasing trend identified on multi authored papers in human DNA research by the US during the period. The recent NSF report indicates that the percentage of internationally collaborative articles in all of science rose from 16% to 25% between 1997 and 2012 in the USA. [National Science Board, 2014] The report also reveals that the relatively high rates of international collaboration have been recorded for Geosciences, computer sciences, mathematics, physics, and biological sciences in the range of 27%-37% during 1997-2012. But this study of human DNA research done in the USA, states that 29% papers are internationally collaborating. There is a huge need for international collaboration in this field to combat threatening diseases at the global level. This study will be a useful input for scientists and researchers work on human DNA research. It also needs to look at the global level analysis to compare different countries.

# Acknowledgement

The authors wish to thank Shri. Subbiah Gunasekaran, CSIR-Central Electrochemical Research Institute, Karaikudi for his valuable suggestions.

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# Impact of Green Information Technology in Library Digitisation

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#### Abstract

The Digital Era has revolutionized the methods for the organisation and automated handling of information .Thinking deeply changing academic environment, ,Libraries should plan ahead and take their services to plan ahead and take their services to where users require most rather than becoming too limited or denying users the chance to learn in modern environment using Viral reference service.The search Engine Technology degraded overtime by the rapid increase of web pages and the retrieval strategies has yielded poor results.This article describes a conceptual model of resource access of academic & public Libraries in Developing countries and discuss about the nature of libraries in this digital age,and mainly the impact of Green IT in Library Digitisation.

**Keywords:** Information Seeking Behaviour / Models in Library Resources; ICT Environment & Services; Changing into Green Environment with Information Technology; Paperless Digital Form.

#### Introduction

The innovations in I.C.T have influenced Libraries serve better and adapt the changes. One of the major developments in the last ten years has been the introduction and spread of the electronic information sources. An academic Library is expected to provide materials for courses, research projects and institutional activity to satisfy the needs of the welldefined specialization clientele like faculty, students relationships, About this (1994) Mr.Boakye describes the document procurement methods and services in his Book. That is the changing IT environment, the Library can help paid resources sharing effectively by overcoming the traditional methods. He concentrates on the Authentication the transition from standalone computing to network environment planning.Library instruction programmes are important which meet the need of the students, The high light is to examine the impact on the users of IT, there have been efforts in the academic community

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Received on 25.03.2017, Accepted on 24.04.2017

to move from a paper based class room to paperless classroom. The internet has become emerging technology for information generation and service to users which make Green IT in Library digitisation is a successful method. Librarians should act as an epitome for sustainability by providing suitable and relevant information to green issues and concerns.

#### **Objectives**

In the Modernknowledgeablesociety, Libraries have a new role and there are various types of Library models. These are as follows;

Traditional Library as a memory Institution, Library as a learning and Research centre, Library as a cultural and communication centre.

Electronic Library, Digital Library.

Virtual Library as Library without wall.

To what extend has Green ICT been employed in Academy Libraries?

What are the factors militating against the application of ICT in Academy Libraries?

Do the staff of the Academy Library have the required knowledge and skills in using ICT resources?

*Purpose of the study:* This is to ascertain their pact of Green ICT on Academy Libraries and the High Lights

of the advantages of merit associated with the ICT on Academy Libraries.

To findout the efficient and effective is the use of Green ICT in Academy Libraries.

#### **Review of Literature**

Libraries should upgrade service by digitising their resources for online user. Today's advanced Information Technology is enabling Library to accomplish this immense task. This digital services should be accessible anyone regardless of time of location through digital communication devices. Automatically, paperless turn into Green, this would be possible when Libraries agree to expand their rilesbeyond the geographical boundaries by using sate of art technology. This is the important point because there is an increasing resource amount of Literature available for any Researcher on Library Resources service, Information seeking behaviour, the Impact of ICT environment. Internet is the main information Tool for all the age groups for information seeking in the ICT Environment. They study the purpose for which Information required the environment in which the user operate the users' skill in identifying the needed information channels and sources preferred fir getting Information. According to the students behaviour and success were also compared in Bilal (2002) study reveals that the use of search Engine and the level of research skills are directly proportional to their success. M-learning is considered the next generation of e-learning using mobile Technologies, students have the awareness such technology of the most impact of IT and role of

Libraries in the Digital Age. In addition to that the Libraries can offer special services. And Resources. Kumaretal (2010) present the shifting of Traditional Libraries to network infrastructure services, types of things, Blogs for Library. They speakon how blog can be used for extending the Library services and support to the dedicated users.

#### Research Methodology

Most researchers use digital finding to locate both digital and print based resources. Print finding aids are used by very few researchers, and those are mainly in the arts and humanities. This high light the need for Libraries to ensure that they provide online highquality for their holdings and that address cataloguing backblogs, present challenge to Libraries is seeking to provide effective services and equitable access to the numbers of such teams. Library have made significant efforts to optimise the visibility and usage of their archival or special collection material through digitisation programme which turn into Green.

Digital collections which brings Green concept useful for Library building collections and this is a major issue for Library with this come to a question of how best to do it. Scholar's communications cantos and Library roles in supporting new developments such as open access Researchers who find print or online access to other Libraries information resources Useful.



#### The Following Figure 1 Explains about this Point

Indian Journal of Library and Information Science / Volume 11 Number 2 / May - August 2017

			SA		Α		SD		)
	Librarians Competences	F	%	F	%	F	%	F	%
1	Librarians possess digital skills/competence	20	23	47	54	14	16	6	7
2	ICT facilities are available in librarians working environment	30	34	50	58	5	6	2	2
3	Librarians have access to digital/internet services	25	29	55	63	3	3	4	5
4	Librarians provide digital information services	42	48	40	46	1	1	5	5
5	There are challenges working in ICT environment	46	53	35	40	2	2	4	5
6	Efforts being made to reduce or deal with identified challenges	32	37	47	54	5	6	3	3

Table 1: Research objectives

KEYS: SA = Strongly Agree, A = Agree , SD = Strongly Disagree , D = Disagree % = Percentage, F = Frequency

Libraries must consider very carefully in the light of these developments and the configuration of their space and services for researchers particularly interms of opening hours and the provision of facilities and closing hours for quiet individual study with the Green Environment whichgive as the pleasant carbon free circumstances.

#### Results

Green collections Development creative Librarians can have an enormous influence on how the patrons see their information gathering and their knowledge of global issues to bear on their considerations of the environmental impacts of the resources types of they choose for their collections. Covering materials and adhesives are in most cases, and as started in regards to the environment, a very friendly product. the electronic front, some progress is being made as well as Google development gadget for Google Desktop that instructs a computer to adjust user's power setting to the U.S Environmental protection agencies recommendations.

#### Finding and Suggessions

- a. Consolidating servers in large institutions using Virtulations so that multiple patrons can share a single machines computing power.
- b. Managing equipment replacement cycles carefully and having older computers repaired.
- c. Finding reputable, recycles of e
- d. waste. Companies who are purported to be recycling may be listed.
- e. Todays advanced Method of Green ICT is enabling Libraries to a accomplish this immense task by digitising their resources for online users.

These services should be accessible to anyone regardless of time and locations through digitalcommunication devices. Automatically, paperless turn into Green. This would be possible when libraries agree to expand their roles beyond the geographical boundaries by using the state of Art technologies.

For this the Following are the Green Information Technology Initiatives

- 1. Device standardisation
- 2. Device Consideration
- 3. Server Virtualization
- 4. Be Energy smart
- 5. Telecomputing as end user satisfaction
- 6. Monitor and PC management
- 7. Green Computing
- 8. Reality check of IT infrastructure
- 9. Reduce Air travel by utilisation Video/ Teleconference.
- 10. Reducing overall paper use when the paper is necessary, using recycled chlorine free, (FSC certified paper).
- 11. Remove active screen servers switch monitors to enter sleep mode after 5 minutes in activity and Reduce cooling in the date centres to appropriate level and increase the ambient Room Temperature.
- 12. Employes shutdown Desktops at the end of the workdays.
- 13. Deploy power management to deliver automated power off to desktop. left on at 9 p.m on workdays.

Require all substantial systems software revisions to include assessment of environmental impact.

#### Conclusion

Libraries are an asset to the future of our society. Libraries are discovering that Green building gives them a great opportunity to educate citizens. Libraries professional should adopt the strategies to promote green marketing and pave to make green products more ecological and viable and economical viable in Academy Libraries.

They can conduct special Events and Prospects.

Environmental Agencies are actively involved or the Government will help the Academy Libraries with funding for Green projects and Renovations.

Start paper Drive, Ask the public students to bring old newspapers and other papers to Recycle.

Hold Recycling contests between grades, individuals and against other Libraries. Put up a Displays about reducing your carbon foot print.

Invite Special speakers to educate your patrons by inviting Professionals who work for environmental causes to give presentation. Start an arts and craft even show patrons the cool items can be made from recycled items, including recycled books. Sponsor an essay contest for kids to write an environment issue they know about the Green.

Traditionally, deselection in Library has involved removing out dated or worn monographs and on occasion serials from collection, finding information in the Library literature that conducts a head to head comparison of the environmental impact of print versus electronic resources is difficult. Academic Library wish to build their green resources including reference works, serials, books, DVD and websites. Library have long been icons of sustainability. Traditions within the Library make it ideally suited to embarrass a newer increasingly urgent to call for sustainability environmentally Green Collections. In evaluating the environmental impact of monograph of electronic resources it becomes clear that books are ultimately more earth Friendly. Given all these creative greening efforts, it is only the natural to take a close look at collection development practice that are in placed by or can be closely adopted by Green practices in Academic Libraries.

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# To Analyze and Understand the Job Satisfaction among University Library Professionals of Delhi

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#### Abstract

This study attempts to examine the relationship between demographic characteristics and job satisfaction among university library professionals in Delhi. It is observed from this study that the experienced library professionals were more satisfied than less experienced. Library professional with higher qualification was more satisfied with job than with less qualification and permanent library professionals were more satisfied with their jobs comparatively management library professionals. Aims to assess job satisfaction among library professionals in terms of status, service conditions, promotional policy and interpersonal relations. To conduct the study 93 questionnaires were sent to the professional's of 7 university libraries of Delhi that are known to have been actively involved in using ICT and received duly filled-in questionnaires from 63(68%) respondents. The result shows that Library professionals like their jobs and they have fine relation as well as understanding between colleagues and supervisor. But they are dissatisfied with monetary benefits and promotional policy of the university.

Keywords: Job Satisfaction; Promotion; Interpersonal Relation; Productivity.

#### Introduction

Libraries play an important role in the higher education sector with their rapidly expanding functionalities from particular discipline to inter disciplinary work with the introduction of Information Communication Technology in library, the work of library professional has become are complex and competitive one when compared to other subject area. Hence in this situation a library professionals need to be specialised in more than one field, so a library professional should have more grasping minded and learning minded to acquire newly introduced knowledge. In this scenario, a library professional should be actively participated in their field, for which fully satisfaction is a must otherwise concentration and development of library

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Received on 19.06.2017, Accepted on 28.06.2017

and library profession will be negative one.

Man primarily works in different jobs to satisfy his needs Satisfaction of needs is essential both for physical survival as well as providing man with pleasure and comforts. Low job satisfaction is a sign of deterioration in the efficiency of work. It may also be a part of grievances, low productivity, disciplinary and other organizational problems. On the other hand, high job satisfaction of employees is a happy sign for the employer for it will promote a congenial relationship between the employer and employee. The study of job satisfaction, a recent phenomenon, perhaps said to have begun in earnest with the famous Hawthorne studies in 1930's. But, historically speaking, interest in job satisfaction started when the central condition of modern industrial organization appeared about 175 years ago. Libraries are the indispensable cornerstones of the society. Job satisfaction of the librarians, who have an important place in the information society, will affect the quality of the service they render.

Job satisfaction is how content an individual is with his or her job. Scholars and human resource professionals generally make a distinction between affective job satisfaction and cognitive job satisfaction. Affective job satisfaction is the extent of pleasurable

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emotional feelings individuals have about their jobs overall, and is different to cognitive job satisfaction which is the extent of individuals' satisfaction with particular facets of their jobs, such as pay, pension arrangements, working hours, and numerous other aspects of their jobs. The effectiveness and efficiency of the service organizations like libraries is measured in terms of quality of its service delivered or rendered to its users. The quality of its service mainly depends upon the quality of workforce, which in turn directly depends on knowledge, adaptability and satisfaction level of the professionals working in a given library. Employee satisfaction is a prerequisite for delivery of quality service and keeps the users satisfied. The service level of the LIS professionals mainly depends upon their commitment, to work which is dependent on the satisfaction that they get from their job. In industrial sectors a satisfied employee is a productive employee of the organization.

Similarly, in the library, a satisfied library professional is regarded as a productive professional. A satisfied professional not only renders quality service to the users, but also ensures commitment to the library in which he/ she is serving and contributes one's might to its image building. In a university library system a large number of professional worked to render quality service to the users. It is possible only when they will satisfy in their profession. Past study shows that most of the university library professionals of Delhi are not satisfied in some issues. That's why it is essential to conduct a deep study regarding the level of satisfaction and dissatisfaction among the library professionals working in the university libraries of Delhi.

#### Literature Review

In the past, most of research scholars have conducted several studies to evaluate librarians' job satisfaction and other issue related to them like, factors affecting librarians' Job Satisfaction. For example, Plate and Stone (1974) studied Librarians issues and compared major aspects of American and Canadian Librarians. The study found that motivators were the prime factors of librarians' job satisfaction while the hygiene was the main factor of dissatisfaction. Job satisfaction is so important because its absence often leads to lethargy and reduce organizational commitment (Moser, 1997).

Sierpe (1999) surveyed Job Satisfaction among universities librarians at Quebec. Spector's Job Satisfaction Survey (JSS) instrument was used to collect the data from 81 (74.3%) librarians. Result of the study shows that although librarians serving were generally satisfied. However, they were dissatisfied with communication and operating procedures. Similarly, Togia, Koustelios, and Tsigilis (2004) examined Job satisfaction among Greek academic librarians. The study concluded that respondents were satisfied with their jobs and dissatisfied with pay and promotions policies. Tysick and Babb (2006) recommended that university authorities should provide librarians the same status as for teaching staff. The researchers' concluded that such benefits would enable them to share their skills and serve community extremely well. Lim (2007) examined the role of information technology (IT) based LIS Professionals. The findings showed that IT LIS Professionals were satisfied to moderate level in job anatomy as compare to traditional librarians. Hart (2010) clearly identified the challenges faced by library leadership and librarians in the long run such as personal development and growth, shortage of staff, promotion and recognition from management. The study found a "love-hate" relationship between respondents and their efforts. Findings showed dissatisfaction of respondents in the context of frustration with insufficient resources and meager payment. Other study of Murray (1999) showed that both LIS Professionals and non-professionals were satisfied with their duties. However, LIS Professionals were more satisfied than non-professionals in their nature of work, obligation and gratitude, advancement, remuneration and in overall job satisfaction. It is a natural phenomenon that a professional with a satisfied job will have more concentration on his/her professional growth. If a professional is not satisfied with his/her job, employer must take care of it to avoid weakness in output (Chaudhary, 2000). However, technological developments are limited in the developing countries which extensively increased routine and manual works for librarians. This also affects librarians' job satisfaction (Velho Lopes, 1992).

Kaya (1995) study found that university librarians in Ankara were not satisfied with physical working conditions, job recognition, job security, promotion, benefits, social status and supervisory autonomy. Horenstein (1993) examined job satisfaction of academic librarians as it relates to faculty status. A total of 300 librarians at the United States participated in the study. Data analysis shows that respondent with academic rank were more satisfied than nonfaculty groups. They were satisfied with salary. St Lifer (1994) studied the perceptions of librarians with their jobs. The study concluded that compensation and benefits, promotion opportunities and technological challenges were the prime factors of job satisfaction. The study found that salaries and benefits were related to job satisfaction. Tella, Ayeni, and Popoola (2007) analyzed job satisfaction research among Ohio Academic librarians. Finding of the study showed that respondents with less experience were generally satisfied with their job.

# **Objectives of the Study**

# The Objectives of the Study are as Follows

- 1. To assess job satisfaction among library professionals in terms of status, service conditions, promotional policy and interpersonal relations.
- 2. To find out significant difference in the mean 'Job satisfaction' scores of the Professionals categorised on the basis of Gender, Age & Qualifications' are compared.
- 3. To suggest means to improve the job satisfaction of library professionals.

# Scope of the Study

The researcher has chosen only 7 university libraries of Delhi. Because they are better off in terms of all resources such as financial, human, infrastructure facilities etc.

# Need for the Study

A happy employee is a better employee which often

Table 1: Survey Response by Library Professionals

is defined as a more productive employee. Researchers have attempted to correlate job satisfaction with efficiency, absenteeism, labour turnover and various other aspects of performance with directly mixed results. Hence, the researcher wanted to do an in depth study with regard to the job satisfaction among librarians in Delhi.

# Methodology of the Study

In order to achieve the objectives of the study, data collection methods included survey method using questionnaire, observation and personal interviews. The data collected were tabulated and analyzed statistically using appropriate descriptive techniques included in Microsoft Excel software package. The descriptive statistics including frequency distribution, percentage, mean etc. were used.

# Data Analysis

Table 1 provides data regarding survey response by library professionals (library assistant to library superintendent). It is seen from the table that 93 questionnaires were sent to the professionals of 7 university libraries of Delhi that are known to have been actively involved in using ICT and received duly filled-in questionnaires from 63(68% respondents.

The gender details of the respondents presented in Table 2 show that out of 63 respondents, 46 (73%) are men and 17 (27%) women.

Name of Unive	ersity	Number of Q	uestionnaires	Received	
	Distributed	Received			
Jawaharlal Nehru Univ	versity (JNU)	15	09	60	
University of Dell	17	09	53		
Jamia Millia Islamia Uni	26	21	81		
Jamia Hamdard Univ	19	14	74		
Indraprastha Unive	04	02	50		
Indira Gandhi National Open	University (IGNOU)	04	02	50	
Ambedkar Univers	ity (AU)	08	06	75	
Total	. ,	93	63	68	
Table 2: Gender-Wise Distribut	ion of Respondents				
Gender	No. of Respondents			Percentage	
Male	46		73		
Female	17			27	
Total	63			100.0	

The respondents were classified into five categories according to their age and presented in Table 3. The age of 3(4.8%) respondents was between 18-24 years,

16 (25.4%) between 25-35 years, 28 (44.4%) between 36-45 years, 13 (20.6%) between 46-55 years and 3(4.8%) between 56-65 years.

Table	3:	Ages	of	Respondents
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Age Range	No. of Respondents	Percentage
Between 18-24 years	03	4.8
Between 25-35 years	16	25.4
Between 36-45 years	28	44.4
Between 46-55 years	13	20.6
Between 56-65 years	03	4.8
Total	63	100

Table 4: Marital Status of Respondents

Status	No. of Respondents	Percentage		
Married	46	73		
Unmarried	17	27		
Total	63	100.0		

It is found from Table 4, that out of 63 respondents 46(73%) were married whereas only 17(27%) were unmarried.

The educational background of 63 respondents is presented in Table 5. It reveals that regarding the general education 30 (47.61%) respondents have Bachelor Degree, 32 (50.80%) Master degree and only one (1.58%) have M.Phil degree. In computer science, four (6.34%) respondents have diploma whereas three (4.76%) respondents have P.G diploma in computer science. With regard to library science, 11 (17.46%) have B.L.I.S. 41(65.08%) M.L.I.S. 5 (7.94%) have M.Phil and 6 (9.52%) have Doctoral degree. It is found that more than 50% of respondents are highly qualified having two masters degrees both in general education as well as in library science. This clearly indicates that the responded universities have highly qualified personnel working in their libraries.

Table 5: Educational Background of Respondents

Name of the Course	General H	ducation	Computer	Science	Library S	Science
	No of Respondents	Percentage	No of Respondents	Percentage	No of Respondents	Percentage
Diploma	-	0.00	04	6.34	-	0.00
Degree	30	47.61	-	0.00	11	17.46
P.G.	-	0.00	03	4.76	-	0.00
Diploma						
P.G.	32	50.80	-	0.00	41	65.08
Degree						
M.Phil.	01	1.58	-	0.00	05	7.94
Ph.D.	-	0.00	-	0.00	06	9.52

Table 6 ranked items of positive statement related to job satisfaction. The ranking process is followed by descending order of mean value. The mean value has been calculated on the basis of likert's scale. It is seen from the table that, out of 10 statements, 8 statements have provided positive mean value ranging from 1.08 to 0.06. It means library professionals have satisfied with these aspects. Out of these, highly satisfied areas (According to rank order) are: 'I enjoy my co-workers', 'I like my supervisor,' 'My job is enjoyable', & 'My supervisor is quite competent in doing his/her job.' It reveals that library professionals like their jobs and they have fine relation as well as understanding between colleagues and supervisor. But out of 10 aspects, 2 statements have provided negative mean value of (-) 0.06 & (-) 0.33. It means library professionals are dissatisfied with these aspects. Dissatisfied statements are: 'I feel satisfied with my chances for salary increases' & 'Those who do well on the job stand a fair chance of being promoted'. The concerns of getting adequate training when new technology is introduced and a fair salary for the work done have very little positive response (mean value 0.06 and 0.08) and deserve attention of the authority. Provision of better in house training is needed in case of introduction of new technology.

Table 7 depicts the result of job satisfaction in terms of Promotion, Benefits, Rules & regulations of the library, Rewards, & feelings of the library professionals. The table shows that, out of 8 aspects 5 items have provided positive mean value ranging from 0.59 to 0.095. As the statements are negative, therefore Table 6: Job Satisfaction (Positive statements)

Rank	items	SA (2)	A (1)	NC (0)	U (0)	D (-1)	SD (-2)	Score	Mean
1.	I enjoy my co-Workers	15	45	0	0	5	0	68	1.08
2.	My job is Enjoyable	10	45	0	0	7	1	56	0.89
3.	I like my Supervisor.	9	35	10	4	4	1	47	0.75
4.	My supervisor is Quite Competent in Doing his/her Job	5	31	14	2	8	3	30	0.48
5.	When I do a Good job, I Receive the recognition for it that I should Receive.	12	25	5	2	13	6	24	0.38
6.	Communications Systems are good within this institution.	6	33	1	5	14	4	23	0.37
7.	I feel I am being Paid a fair amount for the work I do.	6	24	8	1	17	7	5	0.08
8.	I receive adequate training When new technology is Introduced Relating to my Job Duties.	8	25	1	2	17	10	4	0.06
9.	I feel Satisfied with my Chances for salary Increases.	5	21	8	0	23	6	-4	-0.06
10.	Those who do well on the Job Stand a fair chance o f Being Promoted	7	14	8	2	15	17	-21	-0.33

SA= Strongly Agree (2); A= Agree (1); NC=No Comment (0); U= Undecided (0); D= Disagree (-1); SD= Strongly Disagree (-2)

Table 7: Job Satisfaction (Negative statements)

Rank	items	SA (2)	A (1)	NC (0)	U (0)	D (-1)	SD (-2)	Score	Mean
1.	There is Really too Little Chance for Promotion on my job, as it is few & far Between.	13	27	6	3	12	2	37	0.59
2.	I am not Satisfied with the Benefits I Receive	8	23	11	1	18	2	17	0.27
3.	Many of our Rules and Procedures make Doing a good job difficult	9	22	9	1	21	1	17	0.27
4.	I often feel that I do not know What is going on with the Institution	9	23	7	3	16	5	15	0.24
5.	I don't feel my Efforts are Rewarded the way they Should be.	5	19	9	10	17	3	6	0.095
6.	I have Too Much Paperwork	4	18	5	3	26	7	-14	-0.22
7.	My Supervisor Showstoo Little Interest in the Feelings of Subordinates	6	13	11	2	21	10	-16	-0.25
8.	I Sometimes feel my job is Meaningless.	4	15	4	3	21	16	-30	-0.48

SA= Strongly Agree (2); A= Agree (1); NC=No Comment (0); U= Undecided (0); D= Disagree (-1); SD= Strongly Disagree (-2)

highest mean value means low level job satisfaction & lowest mean value means high level job satisfaction. Therefore, the dissatisfied statements are: "There is really too little chance for promotion on my job, as it is few & far between; I am not satisfied with the benefits I receive; Many of our rules and procedures make doing a good job difficult; I often feel that I do

not know what is going on with the institution & I don't feel my efforts are rewarded the way they should be." But the professionals do not support the statements - "I have too much paperwork; my supervisor shows too little interest in the feelings of subordinates & I sometimes feel my job is meaningless." Because these three statements have provided negative mean value.

# Findings

- 1. Library professionals like their jobs and they have fine relation as well as understanding between colleagues and supervisor.
- 2. Library professionals are dissatisfied with salary & promotional policy of the organization. The concerns of getting adequate training when new technology is introduced and a fair salary for the work done have very little positive response (mean value 0.06 and 0.08) and deserve attention of the authority. Provision of better in house training is needed in case of introduction of new technology.
- 3. Issues like promotional policy of the university, benefits; rules & procedure related to jobs & rewards women are more satisfied than men.
- 4. Older age groups (Between 46-55yrs. & 55-65 yrs.) are highly dissatisfied with the issues like promotion, benefits, rules & regulation relating to their jobs etc.
- 5. Library professionals with only BLIS qualification are more satisfied than MLIS & M.Phil /Ph.D holders. Professionals with MLIS degree are dissatisfied with the issues like promotion, salary & job condition. Besides the issues like promotion, salary & job condition MPHIL/PHD holders are also dissatisfied with training facilities.

# Suggestions

- 1. The issues relating to key facet monetary benefits, on which majority of the library professionals of Delhi libraries are not satisfied, need a special consideration. Therefore, qualification wise salary has recommended.
- 2. Most of the library professionals of libraries are not satisfied with present promotional policy of the university. As the promotional opportunities not only fulfill personal ambitions and requirements but also motivate the personal to work more and take additional responsibility. Therefore, it is recommended that management should create more posts in the upper -tiers of the hierarchy and promote the employees working in lower tier.
- 3. Interpersonal relationship in the organization should be a healthy one. There must be free and frank discussions among the superiors and subordinates at regular intervals regarding

policies and decisions. The management must coordinate the staff in a manner so that they cooperate one another in a sincere way.

4. As the twenty first century approaches and information delivery systems are becoming more electronically oriented, professionals must be aware of how users they serve prefer to access information. In this regard if they become success then job satisfaction in computerized work environment will come soon.

# Conclusion

The result shows that different age group of library professionals has a significant impact on job satisfaction. Highest qualification of library professionals has significant impact on job satisfaction. It means that job satisfaction increase in level of education. And experience professionals are more satisfied with their job than less experienced professionals. There exists a statistically significant difference in the job Satisfaction between job statuses of library professionals. It is concluded that different socio demographic factors has the impact on job satisfaction of library professionals.

The effectiveness and efficiency of the service organizations like libraries is measured in terms of quality of its service delivered or rendered to its users. The quality of its service mainly depends upon the quality of workforce, which in turn directly depends on knowledge, adaptability and satisfaction level of the professionals working in a given library. Majority of the library professionals of Delhi libraries are not satisfied with monetary benefits they receive. They also dissatisfied with salary & promotional policy of the organization. The concerns of getting adequate training when new technology is introduced and a fair salary for the work done have very little positive response (mean value 0.06 and 0.08) and deserve attention of the authority. Therefore suitable promotional policies as well as salary structure should be reconstructed to increase productivity in terms of better library service.

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# Effect of Social Networking Sites on the Students' Academic Performance in Jimma University, Jimma, Ethiopia

# M. Natarajan

#### Abstract

Social network is a platform for people share their ideas, to meet new friends and to reconnect with old friends. Social networking sites (SNSs) offer people new and varied ways to communicate via the internet, whether through their PC or their mobile phone. They include MySpace, Facebook, Skype, twitter, Hi, LinkedIn, etc. and allow people to create their own profile and to construct and display an online network of contacts, often called 'friends'. Users of these sites can communicate via their profile both with their 'friends' and with people outside their list of contacts. With SNS it is easy to communicate with classmates, discuss class assignment and even submit project to lecturer, watch videos, make comment on friend's pages etc. This study is focused on the effect of SNS on student academic performance, using Jimma University, Information Science students' as a case study. It is to study the SNS sites used by students and for the purpose of using and to find out whether they affect their studies or help them to learn easily. This research discusses the history of SNS, development and the users of SNS especially Information Science students in communicating with their friends as well. A detailed questionnaire has been designed to assess the effect of SNS on the Students' academic performance and administered to 50 students' selected using a Stratified Sampling Method. The collected data has been analyzed by tables, charts and graphical representation with description. From 50 respondents, Facebook is seen mostly used by the students. They spent more than three hours on SNSs and most of them are using more than three SNSs. 84% of the students are influenced by SNSs on their academic lifestyle so that SNSs affect their academic negatively.

Keywords: Social Networking Sites; ICT; Academic Performance; Students'; Jimma University.

#### Introduction

Jimma University (JU) is one of the public universities in Ethiopia established in 1999 located in Jimma, Oromia Region. It has launched undergraduate Information Science Program in 2005 GC as one of the important steps towards educational development. It has the undergraduate and postgraduate professional degree programs. The university believes that Information Science and newly emerging related fields must be taught together since the technical, humanistic, social and behavioral

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Received on 17.04.2017, Accepted on 24.04.2017

aspects of Information Science are interrelated (Annual Report of JU). An understanding of users must guide information systems design, just as knowledge of technical possibilities and constraints must shape user services towards building knowledge society. Socialization via the internet has become an increasingly important part of young adult life. Social networking sites (SNSs) are very important for everybody to share ideas through text, pictures, videos etc. as they are free. They help people to meet new friends and to reconnect with old friends to communicate via the internet. But the information science students' of JU uses SNSs for entertainments rather than using for discussions in their academics, so it has impact on the students' academic performance in the campus. SNSs are online communities of Internet users benefitting them with other users about areas of mutual interest, whether from a personal, business or academic perspective (William, 2009). However the darker side within technological evolution has resulted in problems

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such as the obstacle of real values of life especially among information science students who form the majority of users interacting through the use of SNSs. The majority of SNSs allow users to sustain profiles of themselves and lists of their friends to share their personal experience through videos, music and other media (Boyd, D and Ellison, Nicole 2008). Some of SNSs sites are MySpace, Face book, YouTube, Skype, LinkedIn etc. those have attracted millions of users. The students consume a lot of time on these sites uploading or downloading, getting information concerning entertainment or for academic work. They are always online every second, chatting with friends, watching online movies and doing research. Some students have become very smart because of the information they get from this sites, the other students' become very poor academically, because it is easy to get almost any materials for school assignment (Boyd, D and Ellison, Nicole 2008).

#### Statement of the Problem

The main reason to study these SNSs is that some students of Information science department in JU use SNSs for academic purposes and others are using for chatting, checking their email, use of Facebook, calling with Skype, their MySpace Web page, updating their Twitter accounts, watching YouTube and sharing photos with their friends and families, by which they are losing their time and energy. They are losing their study time to read books or do research. This paper investigates the effect of social networking sites on the academic performance of Information science students of Jimma University, Ethiopia.

# **Research Questions**

The researcher carried out the research with the following research questions for this study:

- 1. Which SNSs is mostly used by the students?
- 2. How much time do students spend on the SNSs?
- 3. How does the use of SNSs affect students' academic performance?
- 4. Do students use the SNSs for their academic assignments?

#### **Objectives**

The general objective of the study is to determine the effect of social networking sites on information science students' academic performance in Jimma University.

#### Specific Objectives

- To determine the most preferable SNSs used by the students.
- To find out the time students spend on SNSs per day.
- To determine the effects of SNSs usage on the academic performance of the students.
- To find out the relationship between SNSs usage and academic performance of the students.

#### Scope and Limitations of the Study

The study has been conducted only in Jimma University with the Information Science (IS) Undergraduate Students and determines the effect of SNSs on IS students. The Researcher could not able to observe and interview the students who are deeply involved in using SNSs. The researcher has conducted the research only from 50 (sample) students from the total population 217 of Information Science students in Jimma University.

# Literature Review

The increased use of Social Networking Websites has become a global phenomenon in the past few years, which started as a hobby. Teenagers and especially students have embraced these sites as a way to connect with their friends and share information, photos of their activities such as birthday, functions of college, etc. (Boyd, 2007). Social Networking has become an activity that is done primarily on the Internet, with sites like MySpace, Face book, YouTube, twitter, Skype, etc. (Coyle et al., 2008). Many people actively participate in content generation and value creation, and several researchers (Young et al., 2009; Vasalou et al., 2010) have examined their profiles to determine why and to what extent they are keen on posting their entire identity, sharing pictures and videos, and indicating their religious affiliations, marital status, and political orientations on the internet. According to Tuckman (1975), the academic performance of students must be effectively managed and therefore, factors that can affect their performance should be carefully analyzed to reveal whether these factors influence them negatively or positively. Accordingly, if students' involvement in SNSs comes with disadvantages it must be kept away from their academic life but if used as an instrument in knowledge building and spreading it should be considered in constructing knowledge.

#### Academic Performance and SNS Usage of Students

Tuckman (1975) defined performance as the apparent demonstration of understanding, concepts, skills, ideas and knowledge of a person and proposed that grades clearly depict the performance of a student. Hence, academic performance must be managed efficiently keeping in view all the factors that can positively or negatively affect their educational performance. Kirschnera (2010) revealed that students who multi-task between SNSs and homework are likely to have 20% lower grades than a student who does not have a social networking site in visual range. He believed that even running a SNS on the background on a student's PC while studying or doing homework could lower a student's grade. He believed that "the problem is that most people have Facebook or other social networking sites, their e-mails and maybe instant messaging constantly running in the background while they are carrying out their tasks" (Enriquez, 2010). American Educational Research Association conducted a research and it has declared on its annual conference in San Diego, California (2009) that SNSs users study less and generated lower grades eventually. Student's use of social networking continues to create challenges and issues for higher education professionals and keeping abreast of these challenges has proved difficult because of the speed at which new technologies are being introduced.

#### Social Networking Sites and the Users

The issue of whether social networking helps or hurts a student's academic performance is often depend on the larger issues identified with the overall use of SNS (e.g., its psychological effects; individual self-discipline and self-regulation concerns; human adaptability concerns). The benefit of using SNS includes: room for creativity among individuals, encouraging greater social interaction, greater access to information and information sources; it give individuals a sense of belonging among users of the same SNS; reduces barriers to group interaction and communications such as distance and social/ economic status; and increasing the technological competency levels (Zwart, Lindsay, Henderson & Phillips, 2011). The use of SNSs has been repeatedly found to be the highest among those between the ages of 18-29 (Rainie, 2011); while the fastest growing segment utilizing SNSs since 2008 has been among those ages 35 and older. Approximately 61% of teens age (12-17) utilize SNSs to send messages to their friends on a regular basis (Lenhart, 2009). Overall, it has been found that women use SNS more than men to communicate and exchange information (Hampton, Rainie, & Purcell, 2011). Hence, this study is to find out the effect or impact of social network on students.

# The Effect of Social Networks on the Academic Performance

Shah et al. (2001) studied that student users are affected by the internet and this impact is determined by the type of usage. The effect of SNS usage depends on the type of SNS the student is using. Current college students use SNSs for social connections and entertainment, but are also using it for education and professional purposes. Students who uses multi-task between SNSs and homework are likely to have 20% lower grades than a student who does not have a social networking site in visual range. However, many researchers also found a positive association between use of internet and SNS and academic performance of the student users. Students, using internet frequently, scored higher on reading skills test and had higher grades as well (Enriquez, 2010). From the above literature it is found that, there are no previous studies conducted on SNS usage in Jimma university information science students and their effect on the academic performance. Hence, this study has been focused on the effect of SNS on the academic performance of information science students in the Jimma University.

#### Methodology

The data has been collected by using a detailed questionnaire, which was administered on Fifty (50) undergraduate Information Science students' in Jimma University (JU) during the 2014/2015 academic session. From the total population (217), of all undergraduate information science students comprising from three batches  $N_{1 (year 1)} = 77$ ,  $N_{2 (year 2)} = 62$  and  $N_{3 (year 3)} = 78$  of Information Science students, the researcher selected 50 students based on stratified random sampling method. An appropriate sample size is means of gaining high precision, accuracy and confidence with minimum cost. The study used Sample Size Calculator software Raosoft, Inc. to calculate the sample size by giving the margin of error 12.2%, the confidence level 95%, and response distribution 50% with the total populations of 217. From this, the researcher has used the recommended sample size of 50 students. In this study, the following variables were selected viz. 1) Social Networking Sites as Independent Variable and 2) Students academic performance as Dependent Variable.

#### Data Collection Method and Analysis

Data has been collected by distributing selfadministered questionnaire to 50 students randomly along with description about filling the questionnaire. Descriptive statistics has been employed and analyzed the collected data. It involves summarizing, tabulating, organizing and graphical representation or pie chart data for the purpose of describing a sample of individuals that have been measured.

#### **Results and Discussions**

The research has been carried out on "The effect of social networking sites on information science students' academic performance in Jimma University". From the data collected through questionnaire the analysis, interpretation, results and discussion of data has been carried out below:

#### Gender and Age Analysis

Questions like age, gender and year of entrance for the students into campus were included. From the data received for a sample of 50 respondents in the JU, Information science department students, Gender and Age are shown below:

From the Table 1, out of 50(100%) respondents, 39 (78%) of the respondents were male while 11(22%) were female. Therefore, the number of respondents are enough to represents the total population.

From Table 2, 29(58%) of the respondents were between the age of 22 and 27 years old, and 21(42%) were between the age of 16 to 21 years old while no one is 28 years and above. This implies that most of the respondents are between the ages of 22-27.

Sex	No. of respondents
Male	39 (78%)
Female	11(22%)
Total	50 (100%)
able 2: Age distribution	
Age (years)	No. of respondents
Age (years) 16-21	No. of respondents 21 (42%)
<b>Age (years)</b> 16-21         22-27	No. of respondents 21 (42%) 29 (58%)
Age (years)         16-21         22-27         28 and above	No. of respondents 21 (42%) 29 (58%) 0 (0%)

#### Mostly Used SNSs by Students

From the collected data related to the use of different

SNSs and the number of SNSs used by the students are given below as Table 3 and Table 4.

Table 3: Mostly used SNSs	
SNSs	No. of Respondents
Facebook	27 (54%)
YouTube	18(36%)
Twitter	0(0%)
Skype	0(0%)
Others	0(0%)
Both Facebook & YouTube	5(10%)
Total	50(100%)
Table 4: The number of SNSs	
Number of SNSs	No. of Respondents
1	2(4%)
2	12(24%)
3	9(18%)
>3	27(54%)

From the above Table 3, it is found that 27 (54%) students, mostly use Facebook on a typical day, followed by YouTube with 18(36%), both Facebook and YouTube usage were 5(10%) and no one is using

Twitter and Skype. This shows that Facebook is mostly used by information science students in JU, Ethiopia. Table 4 shows that 2(4%) of the respondents use one SNS, 12(24%) of the respondents use 2 (two)

SNSs, 9(18%) of the respondents use three SNSs and 27(54%) of the respondents use more than three SNSs daily. Therefore, it is concluded that most of information science students, in JU, use more than three SNSs in their activity.

#### Time Spent Time on the SNSs Daily

It has been requested for the time spent on the SNSs daily through the questionnaire. The collected data is given below as Figure 1.

Figure 1 shows that 2(4%) of the respondents use SNSs approximately 30 minutes per day, 7(14%) of the respondents use it for 1 hour per day, 2(4%) use it for 2 hours per a day, 8(16%) use SNSs for three hours per a day and 31(62%) use SNSs for more than three hours. Therefore, it is concluded that most of information science students (i.e. 31(62%) of the respondents), in JU use the SNSs more than 3 hours in a day.

#### Influence of SNSs

It has been requested about the influence of SNSs in their lifestyle. The answers given are in below Table 5.

From Table 5, it is found that, 84% of the respondents (that most of information science students) were influenced by SNSs in their academic lifestyle while 16% were not influenced by SNSs in their academic lifestyles.

It has been requested in the questionnaire, that the nature of use of SNSs for academic or for entertainment. The response is shown below as bar chat in Figure 2.

The Figure 2 shows that, 37(74%) of the respondents have used SNSs for entertainments while 13(26%) used for academic purposes through lifestyles. It concludes that most of information science students in JU, use SNSs for entertainment and this affect their academics.



Fig. 1: Time spent by students on the SNSs daily

#### The Primary Use of Social Networking Sites

It has been requested for the primary use of SNSs and the resources consulted by them. The response received is below in Table 6 and Table 7.

The Table 6 shows that, 7(14%) of the respondents were primarily use SNSs for downloading music/videos, 7(14%) use for posting photos, 28(56%) use for chatting with their friends while none use SNSs for communicating with teachers and playing games.

It shows that most of information science students (28), in JU primarily use SNSs for chatting with their friends.

Table 7 shows that, 27(54%) of the respondents consult all types of resources, 7(14%) consult academic resources, 15(30%) consult social resources and 1(2%) consult philosophic resources.

Improvement of academic performance by using SNSs.

Table 5: The influence of SNSs in academic lifestyle

Effect	No. of respondents	Percentage (%)
Yes	42	84
No	8	16
Total	50	100

It has been requested regarding the academic performance of them by the use of SNSs. The response is shown below as Table 8.

SNSs. Out of those, 4 respondents were excellently improved their academic performance, 22 respondents improved their academics in a very good way and 11 respondents were improved their

Table 8 shows that, 37(74%) of the respondents have improved their academic performance by using



Fig. 2: Nature of SNSs use

academic performance in Good way. 13(26%) of the respondents were not improved their academic performance in SNSs.

It has been requested for their study time affected, due to the use of SNSs. The data given by them is given below as pie chart in Figure 3.

From the above pie chart, it shows that 42(84%) of the respondents agreed to the use of SNSs which affects their study time, while 8(16%) of the

SNSs Activities	No. of Respondents
Download music/video	7(14%)
Posting photos	7(14%)
Chatting with friends	28(56%)
Sharing files	8(16%)
Communicating with teachers	0(0%)
Playing games	0(0%)
Others	0(0%)
<b>Table 7:</b> Resources consulted by SNSs	
Table 7: Resources consulted by SNSs           Resources	No. of Respondents
Resources         All type of resources	No. of Respondents 27(54%)
Resources         All type of resources         Academic	<b>No. of Respondents</b> 27(54%) 7(14%)
Resources         All type of resources         Academic         Social	No. of Respondents 27(54%) 7(14%) 15(30%)
Resources         All type of resources         Academic         Social         Philosophic	No. of Respondents 27(54%) 7(14%) 15(30%) 1(2%)
Resources         All type of resources         Academic         Social         Philosophic         I don't know	No. of Respondents           27(54%)           7(14%)           15(30%)           1(2%)           0(0%)

respondents said the use of SNSs doesn't affect their study time. Therefore, it is concluded that the study time of information science students in JU, is affected due to the use of SNSs.

It has also been requested to the students that, if they were not using SNSs, how they should have spent their time; and the effect of use of SNSs also been questioned for which the response given by them is given below in Table 9 and Table 10.

From Table 9, it is found that 88% of respondents were studying their academics, 6% were socializing with their classmate and other friends, 4% were

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reading novels in their time, 2% of the respondents do other thing to fulfill their daily activities and none of them do more constructive work in their free time. From this, it is concluded that most of information science students, in JU were studying their academics.

From Table 10, it is found that 22(44%) respondents agreed that the use SNSs affect their academics positively, 25(50%) respondents said that it affects negatively while 3(6%) said that they are not affected by the use of SNSs. Thus, this shows that though students devote their times on the SNS, their studies and academics are affected by it as seen by the percentage of affect negatively by 50%. From this, the researcher concludes that most of information science students, in JU were directly affected negatively.

It has also been requested to the students, the kind

of communities they subscribed in SNSs, the response

subscribe to entertainment, 20(40%) students subscribe to informational communities to get the

right information at the right time and 2(4%) students subscribe to other than educational, entertainment

and informational communities. Therefore, it is concluded that many of the students subscribe to entertainment and informational communities rather

From Table 11, it is found that 10(20%) of the students subscribe to educational communities and manage their academic status, 18(36%) students

is given below in Table 11.

than educational communities.

Table 8: Academic improvement of the	e students in using SNSs
--------------------------------------	--------------------------

	No. of respondents	Percentage (%)
Yes		
Excellent	4	-
Very good	22	-
Good	11	-
Total	37	74
No	13	26
Total	50	100



Effect of SNS on the Study time of students

Fig. 3: The effects of the use of SNSs for their study time

Table 9: Students activity far apart from SNSs

Activities	No. of Respondents
Studying	44(88%)
Socializing	3(6%)
Doing more constructive work	0(0%)
Reading novels	2(4%)
Others	1(2%)
Total	<b>50</b> (100%)

#### Major Findings

From the above study, it is found that social networking sites affect students' academic performance negatively. It directly causes the gradual drop of grades of students and affects a student's academic performance and influenced students to consider entertainment over learning/studying. It is also found that majority of students agreed that the SNSs have negative influence on their academic performance of information science department in Jimma University and they are spending too much

Table 10: The effect of the use of SNSs on students' Academics

Effects	No. of respondents
Positively	22(44%)
Negatively	25(50%)
No effect	3(6%)
Total	50(100%)

time on SNSs.

Facebook is the most popular SNSs used by information science students in Jimma University. The study also found that they mostly use SNSs for keeping in touch with friends for / by updating their

Table 11: Subscribed communities on SNSs

Community	No. of respondents	Percentage (%)		
Educational	10	20		
Entertainment	18	36		
Informational	20	40		
Others	2	4		
Total	50	100		

decrease the students' academic performance. These findings described here will help to build a foundation for future investigations of these and other important issues surrounding social network sites.

# Conclusion

The primary aim of this research is to find out the effects of Social Networking Sites on the academic performance of Information Science Students of Jimma University, Ethiopia. There are so many effects of using SNSs in academics: From 50 respondents, Facebook is seen to be mostly used by students. 54% of the respondents used more than 3 SNSs at a time in their activity. 62% of the respondents were spent more than 3 hours on SNSs in a day, so that it affects their academic performance. 84% of the respondents were influenced by SNSs in their academic lifestyle while 16% of them are not influenced by SNSs in their academic lifestyles. This implies that most of the students are influenced by SNSs on their academic lifestyle. 74% of the respondents were used SNSs for entertainments and so it might affect their academics. 56% of the respondents were primarily used SNSs for chatting with their friends while no one from the respondents primarily use SNSs for communicating with teachers. In the academic perspective, 54% of the respondents were consulting all types of resources. 84% of the respondents agreed on the effect of SNSs on their study time. 50% of the information Science students are affected by SNSs negatively while 6% were not affected in any way by their use of the SNSs. From this, it is concluded that, SNSs affect the students' academics negatively. 40% of the respondents subscribe informational communities to get the right information at the right time. 70% of the students have agreed that SNSs affects their academics negatively on the other and in general, SNSs affect

the students' academics negatively.

#### Recommendations

uploading pictures.

Based on the results, the following recommendations are proposed:

status regularly, posting their photos, writing on their friends' walls or chatting with their friends and

The study also noted that the students spend more

than three hours daily on the SNSs, those definitely

- The Jimma University might take the disadvantage of the popularity and negative impacts of the SNSs use to formally incorporate the use of SNSs in the teaching and learning processes.
- Government regulatory agencies may arrange to monitor internet activities and improve any existing guidelines on internet usage in general focusing on SNSs use for information science students' in Jimma University.
- Guardian/protectors provide appropriate advice to students when using the SNSs.
- School administrations should create a technology policy that forbid students from using social networking sites.
- Universities should cut the time that students spend on these SNSs by blocking the sites, that could help students become more focused on their studies.
- The university should create awareness for students about what SNSs are and the possible consequences of incorrect usage. Attention should also be paid to ethical vs. unethical behaviors and arrange to protect with security and privacy information.
- Technology teachers could give information sessions to students at the beginning of the year for the use of technology like SNSs.

# Suggestions for Further Study

It has been suggested, based on this study that, further research should be done on:

- The Impact of SNSs and social media research with a large population size and it should cover all the students in Jimma University.
- Effort should be focused on how SNSs influence on the academic achievement of information science students in Jimma University.
- Effort should be made by researchers to focus on how SNSs retard the teaching and learning processes.

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# Analysing Social-Demographic Differences in Accessing and Using Agricultural Information Services in Tanzania

# Getrude Robert Ntulo\*, Japhet Otike\*\*

#### Abstract

This paper analyses the influence of social-demographic features in accessing and using agricultural information services among small-scale crop farmers in Tanzania. The survey approach was adopted. The study involved 150 small-scale crop farmers from Rukwa region. A combination of qualitative and quantitative research methods was used. Data was systematically collected. Questionnaires were used to collect data supplemented by interview and observation. Chi-square analysis was used to determine the significant factors affecting access to and use of agricultural information services. The results were cross-tabulated against social-demographic features of respondents. The findings show that social- demographic characteristics of respondents such as age, gender, education level and average income per year have an influence on agricultural information access and use. The study recommended that the existing agricultural information systems and services should be reviewed. A centralized agricultural database management system should be established to collect, organize, and disseminate agricultural information to small-scale crop farmers focusing on their social-demographic differences.

**Keywords:** Access; Agricultural Information; Agricultural Information Services; Social- Demographic Differences; Use; Tanzania.

#### Introduction

Agriculture is the backbone of the country's economy. It is dominated by small-scale subsistence farming in which approximately 68% of the cultivated land is used by small-scale farmers who operate between 0.5ha and 2.0 ha (URT, 2011). It is one of the most important sectors which have always been under considerations throughout the world. Agriculture plays a significant role in the social-economic development of any country particularly developing countries like Tanzania. Agricultural information service provision is at the center of it. To boost the sector; the government has introduced

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Received on 03.05.2017, Accepted on 16.05.2017

various strategies such as Agricultural Sector Development Plan, Economic and Social Action Plan, Rural Development Strategy, Tanzania Development Vision 2025, adopted the Sustainable Development Goals (SDG) and the recent "Agriculture First" popularly known as Kilimo Kwanza to facilitate agricultural development. However, despite having these strategies to facilitate agricultural development, agricultural performance is unsatisfactory (URT, 2011). Tanzanian farmers particularly those in Rukwa region are not benefiting from these agricultural innovations. This is probably because the farmers do not know where to get vital information or because information is not properly and adequately disseminated; it is uncoordinated and fragmented which lacks focus and proper strategies in addressing small-scale farmers' information requirements (URT, 2011). Studies show that despite having enormous and varied information needs, the needs have not been met and for decades information service providers have failed to provide effective information services to farmers in Tanzania. (Siyao, 2012). This situation is attributed to inadequate flexible information service provision strategies coupled with the influence of social-demographic

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#### features.

Farmers need information to make informed decisions and address their daily social and economic needs. Small-scale crop farmers need information for various reasons. They include but not limited to knowing the procedures of increasing crop production, effective use of fertilizers, useful pesticides and insecticides, access to credit facilities, adding value and marketing of their crop products, high yielding seeds etc. Well informed and information-conscious small scale farmers are a roadmap to sustainable crop production. Although information is recognized as an important resource in the agricultural development and crop production in general, the extent to which information services provided to small-scale farmers is influenced by social-demographic features in the country is not clearly demonstrated with very few studies that focus on it. Social-demographic variations in accessing and using agricultural information services might be along the dimensions of sex, age, gender, education level, income per year and crop yield per year (In 100kg bags). These variations tend to affect access to and use of agricultural information services. This study, therefore, endeavored to analyze the influence of social-demographic features on agricultural information services provided to small scale crop farmers with a view to proposing strategies to minimize the problem.

# Objectives of the Study

- **1**. To determine the social-demographic characteristics of small scale crop farmers in the region
- 2. To explore the influence of social-demographic features on agricultural information services
- 3. To propose strategies to minimize the influence of social-demographic differences in accessing and using agricultural information services.

# Literature Review

Information is a raw material for any meaningful agricultural development. The prosperity and growth of agricultural industry in any country depend on how it acquires, produces, processes, uses and disseminates relevant and good quality agricultural information to its stakeholders. Tanzania has accumulated a vast amount of agricultural information over years. The increase of new technology and innovation has greatly contributed to the massive production of agricultural information through research conducted by various institutions countrywide.

# Agricultural Information Needs

Small-scale crop farmers constitute a particular group of users whose information needs are very specific to their farming activities. Their information needs are dynamic and vary according to their daily activities and exposure to new innovations. Several scholars in Africa and other developing countries worldwide such as Agyei and Osman (2014) in Ghana; Bernard, Dulle, and Ngalapa (2014) in Tanzania and Omogor (2013) in Nigeria, to mention, but a few surveyed agricultural information needs of small-scale farmers in their respective areas. These scholars come into a consensus that, farmer's information needs vary from one individual to another, village to village and from one farming activity to the next. The surveys also show that smallscale farmers need information for various purposes in the course of undertaking their agricultural activities. They also use different sources and media to have access to such information.

# Sources of Accessing and Using Agricultural Information

For information to be accessed and used by the intended audience, it has to be carried in a userfriendly format which takes into consideration the user's literacy level, age, economic status, culture and above all, user's preference. Craig and Stilwell (2003), noted that print agricultural materials are used extensively to provide information to farmers; they play a vital supportive role in information service provision especially to low –literate communities. However, print sources of information cannot be used by illiterate farmers who are scattered all over rural places in Africa including Tanzania. Angelo, Msuya, and Matovelo (2016) observed that in Tanzania several print agricultural sources of information are used to disseminate information to farmers, the main avenues being books, research reports, newsletters, handbooks, conference proceedings, journals etc. Reports are produced annually or by-annually by different research institutions such as Universities, COSTECH, REPOA, and not for profit agricultural organizations.

The decline of agricultural production in the recent past indicates that despite having a vast amount of agricultural information in the country, small-scale farmers are not fully accessing and utilizing it. This situation may probably be attributed to the fact that the information services provided do not put into consideration the demographic differences. As a result agricultural information is minimally accessed and utilized. Small-scale farmers use agricultural information throughout their farming season. However, studies have shown that several factors such as cultural, social-economic, demographic factors, personal, political and geographical variables affect agricultural information use (Opara, 2010, Siyao, 2012, Lwoga, Stilwell and Ngulube 2011 and Agyei and Osman, 2014).

Murugan and Balasubrami (2011) conducted a study on information seeking behavior of cassava growers in India. The study found out that, farmers mostly use radio, films, video and television programs. Most studies in developing countries, particularly Africa show that small-scale farmers prefer informal verbal communication in accessing and sharing agricultural information. For example studies by Agyei and Osman (2014), Lwoga, Ngulube and Stilwell (2010), Asenso-Okyere and Mekonnen (2012), Mwakaje (2010) and Mtega, (2012) show that smallscale farmers prefer their fellow farmers, neighbors and village leaders. Other informal sources utilized in the named studies include church leaders, traditional dances, and experience which is shared among farmers orally, opinion leaders, and role models. Omogor (2013), found out that sources used to access agricultural information include towncriers, marketplaces, socio-political meetings, traditional festival, role play, songs, and dance, demonstration, lecture and exhibition, mobile handsets, television, and radio. Internet-based sources of agricultural information; agricultural magazines newspapers and libraries were found to be rarely used in most parts of Africa.

# Agricultural Information Service Provision

The vast store of agricultural information has been built up in the world over many years since the ancient Babylonian time. The ultimate aim of agricultural information has always been to increase agricultural production. Thus improved information flow to, from and within the agricultural sector is a pre-requisite for effective and meaningful agricultural production and development. According to Salami et al, (2010) African smallholder farmers can be categorized on the basis of the agro-ecological zones in which they operate; the type and composition of their farm portfolio and landholding; or on the basis of their social demographic characteristics. This categorization facilitates agricultural information service provision for instance agricultural reference services; selective dissemination of agricultural information, information referral services and agricultural information translation services. Reference service provides the mechanism by which the users of agricultural information can interface with the larger body of knowledge to secure what they need for their daily farming activities. According to Bopp and Smith (2011), the service may range from the provision of desired information to the training and educating the user to identify and locate what he/she needs from a larger body of knowledge, in this case, agricultural knowledge. Aina (2004) asserts that information users have different information queries that need to be solved by librarians or extension officers in the case of farmers. It is a person to person information service where information service providers need to articulate the problem of the user clearly. With the advent of ICTs, reference services have been made easier, as most of the reference queries can easily be answered through surfing the internet or searching relevant databases like AGRICOLA, AGRINET, CABI or AGRIS. Selective dissemination of agricultural information aims at providing small scale crop farmers with information that will promote their inquiry for information on their daily farming activities. It is a personalized information service. It helps information service providers to sieve information from a vast amount of documents and other relevant information for farmers. This helps to serve the time of farmers and information service providers (Aina, 2004a). In the process of providing Selective Dissemination of Information (SDI), agricultural information service providers select relevant information and provide it to small scale crop farmers to address their information needs. This process is done after processing it, i.e repackaging, organizing, abstracting and assessing it before making it useful to small-scale farmers. Information service providers have to communicate with small scale crop farmers, interview them and set user profile in order to be able to provide specific and relevant information based on their information needs. Aina (2004b) asserts that there are situations where information users are directed to another information source or alternative information resource center. For example, small-scale crop farmers might be directed to another agricultural expert, organization or a research institute which provide agricultural information. This is called information referral service. The role of agricultural information service providers is to search for and maintain an updated list of experts, researchers or organizations which produce and provide agricultural information. These organizations, experts or researchers where small-scale crop farmers will be referred to in case of information needs should be reliable and trustworthy with high utility and credibility.

Agricultural information is always accompanied by technical jargons which are difficult for small-scale farmers to digest. Studies by Lwoga (2010), FAO (2012) and Agyei and Osman (2014) show that one of the challenges facing small-scale farmers in accessing and using agricultural information is the presence of too many technical terms. Aina (2006) suggested agricultural information repackaging in a format that would be comprehensible to farmers i.e familiar language. It is a good method of providing information service to farmers. He also suggested that information service providers should be equipped with necessary skills that would help them in information repackaging. Various literatures show that farmers understand better and utilize information which is provided in a language which is familiar to them, i.e their own local languages.

#### Methodology

The study involved 150 small scale crop farmers from Rukwa region. A combination of quantitative and qualitative research methods was employed in the study. Systematic sampling was used to select 150 small scale crop farmers. Purposeful sampling was used to select villages with field farm schools, 50 small scale crop farmers, 27 information service providers and six district agricultural and livestock officers as key informants. Questionnaires were used to collect data supplemented by interviews and nonparticipant observation. Quantitative data was analyzed using descriptive statistics. Statistical measures (Chi-square) were used to determine the significant factors affecting access to and use of agricultural information services. The results were cross-tabulated against social-demographic features of respondents. Qualitative data was thematically analyzed based on study objectives. The results were presented using frequency distribution tables, bars, charts, and figures.

#### **Findings and Discussion**

#### Social-Demographic Characteristics of Respondents

Respondents were asked to indicate their age ranges, gender, education level; the size of land cultivated and crop yield and average income per year. These demographic characteristics of respondents were included in the study with the purpose of examining their influence on the whole process of accessing and using agricultural information services. Statistical-Chi square test was performed to examine the relationship among demographic variables as independent variables and aspects of information service provision as dependent variables. The findings are presented in Table 1.

The study established that a significant number 69 (45%) of the respondents were middle-aged 30-39 years and 44(29%) respondents were 40-49 years. The finding of this study with regard to age of respondents concurs with most of other studies done on small scale farmers in Africa and other parts of the world (Munyua 2011; Benard, Dulle and Ngalapa 2014 and Agyei and Osman (2014) Small scale farming activities are dominated by middle-aged people who are energetic, enthusiastic and ready to learn new farming technologies through agricultural information services provided to increase crop productivity. However, this was not the case for small scale crop farmers in the study area. Although most of them were young, middle-aged and energetic, they still relied on poor methods of farming which resulted in low crop production. This situation is partly attributed to the fact that most of them are either not exposed to agricultural information or they do not know where and how to access it. Gender and education level of respondents are said to have much influence on agricultural information access, use and agricultural information service provision in general. The findings show that out of 150 respondents, 76(51%) were female and 74 (49%) were male ranging from 20 to 69 years. The majority (73.4%) of the respondents had primary education, and eight (5.2%) had secondary education. Among respondents with primary education, 62(81.6%) were female and 51 (68.9) were male. The Pearson Chi-squire findings show that there was a statistical significance between gender of respondents and their education level (pvalue  $\leq 0.05$ ). Modern agricultural information is recorded in different forms and formats outside the human memory. To access such information, the user is required to be literate with some skills on how and where to obtain the information. Low crop production and sluggish economic growth in the study area may be attributed to the reliance of residents on human memory and experience from friends and colleagues to obtain agricultural information. Through education, small scale crop farmers can acquire necessary knowledge and skills to facilitate their crop production. For farmers who are illiterate or have low literacy levels like those in the study area, appropriate information packages are required to facilitate agricultural information access and usage to enhance crop production.

The findings show that small-scale crop farmers cultivated an average of 3.4 acres per person with an average of 22 bags per year. The highest recorded average number of bags per acre was 25 and 23 bags at Kalumbaleza village and Mtimbwa village respectively. According to Rukwa Investment Profile (2013), the average crop production per acre was minimally 15 cereal bags and maximally 20 100kg maize bags per acre. The findings show that smallscale crop farmers obtained approximately seven maize bags per acre. This crop production trend was low compared to 2012/2013 Rukwa region crop production trend (Rukwa Investment Profile, 2013). It was also shown that the bigger the land one owns the more crops one obtained. A statistical test (Pierson Chi-Square) show that there was a significant difference between land ownership and crop yield in bags per year as the P-Value was 0.01.

N=150

Character	istics	Frequency	Percentage
Sex	Male	74	49%
	Female	76	51%
Age (In years)	20-29 age bracket	23	15.3 %
	30-39 age bracket	69	46%
	40-49 age bracket	44	29.3%
	50-59 age bracket	8	5.3%
	60-69 age bracket	6	4%
Education (Highest attained)	Non	18	12.7%
	Informal education	11	8.7%
	Primary education	113	73.4%
	Secondary education	8	5.3%
Size of land cultivated	Less than an acre	33	22%
	1-5 acres	72	48%
	6-10 acres	35	23%
	More than 10 acres	10	7%
Crop yield in 100kg	Less than 5 bags	38	25%
bags/year	5-10 bags	55	37%
	11-15 bags	48	32%
	16-20 bags	8	5%
	More than 20 bags	1	0.7%
Average income/ year (TSH)	100,000-200,000	43	28.7%
,	201,000-300,000	54	36%
	301,000-400,000	36	24%
	401,000-500,000	16	10%
	500,000+	1	0.7%

Table 1: Demographic Characteristics of Respondents

The Influence of Social-Demographic Features in Accessing and Using Agricultural Information Services

The Pearson's chi-Square test was used to determine whether there was a significant difference between independent variables like age, gender, education, and income per year and dependent variables like information services accessed and the sources used to access information Pearson's chi-Square test was used because the frequencies obtained on information needs needed to be further tested to determine the influence of demographic variables in accessing and using agricultural information. Based on the chi-square test, if the "P" value (Asymp.sig) is greater than 0.05, then there is no significant difference among the variables being tested. This means one variable does not influence the other. But if the "P" value is less than or equal to 0.05, then there is a significant difference among the variables being tested, i.e one variable influences the other.

#### Agricultural Information Accessed and Used by Gender

The findings show that male respondents were leading in most of the accessed information while their female counterparts were leading in accessing trade fair information.

For example, female scored 35 (55%) in trade fair information and male respondents scored 29 (45%). From a Pearson chi-Square test performed, it was established that there was a significant difference on information accessed by gender with the P-Value .000 across gender. It can, therefore, be deduced that gender influenced agricultural information accessed. More information is obtained in Table 2. Getrude Robert Ntulo & Japhet Otike / Analysing Social-Demographic Differences in Accessing and Using Agricultural Information Services in Tanzania

Accessed Information	Female		Male		Pearson's chi-Square (P-	Remarks
	F	%	F	%	Value	
Trade fair	35	55	29	45		
Warehouse Receipt System	41	47	46	53		
Where and how to get market for crops	65	51	63	49	$x^{2} \le 51$	
Horticulture	27	44	35	57	df= 8	Significant
Credit and loan facilities	42	47	47	53	Appro. Sig=.000	Difference
Input subsidy	38	48	42	53	(2 sided)	
Irrigation	41	47	47	53	P-Value	
Proper Modern farming methods	37	44	48	56	.000	

The findings of this study concur with a study by Odini, Otike and Kiplang'at (2012), which established that women were constantly in need of information related to their daily activities of farming, business, education, and training, among others. In most developing countries and Africa in particular, women are the productive forces in the agricultural sector. They are faced with a dual responsibility of taking care of the family and at the same time, engage in productive activities to raise income for the family. This is probably the reason why most female respondents needed more information on trade fair activities and credit and loan facilities compared to male respondents.

The findings show variations of information accessed across villages. Information on trade fair ranked high at Kalumbaleza 15(23%), Muze and Mtowisa with 13 (20%) respondents each, and Katuka 11(17%) followed by Kasense 13(26%). Information on Warehouse Receipt System ranked high at Kizombwe 15(17%), Kasense 14(16%), Kalumbaleza 12(14%) and Msanzi 12(14%). Information on

horticulture was rated high at Kizombwe 15(24%), Mtowisa 13(18%), Kalumbaleza 11(18%), Kasense 8(13%) and Milanzi 8(13%). Statistical test from Pearson chi-Square test performed established that there was a significant difference on information accessed across villages involved with the P-Value .000. A similar trend in accessing agricultural information across villages was observed by other studies worldwide. For example, in Tanzania, studies by Lwoga (2010); Bernad, Dulle and Ngalapa (2014); Elly and Silayo (2013) and Lwoga, Stilwell and Ngulube (2011) observed that small scale crop farmers across villages and communities have varied information needs. Similary, Byamugisha, Ikoja-Odongo, and Nasinyama (2010) in Uganda found out that the information needs of the urban farmers in the study area seemed to be as varied as their farming activities and also appeared to vary from one urban farmer to another. Another study by Agyei and Osman (2014) in Ghana revealed that the farmers' range of information need differed greatly depending on the level of their activities and also from one community to another.

N=150



\*Multiple Response was possible

Fig. 1: Sources Used to Access Agricultural Information by Gender N=150

#### Gender Differences on Sources Used to Access Agricultural Information

Gender analysis was made on sources used to access agricultural information. It was established that there were slight differences in preference of information sources used by respondents with P-Value of less than 0.05 in all frequently used sources of information. More female respondents 53(70%) used gatekeepers as their source of information compared to male 50(68%) respondents. The findings further show that radio programs were more preferred by female 30 (40%) than male respondents 21(28%). This is probably because female spend more time at home taking care of the family compared to men, thus they have ample time to listen to radio programs. Extension officers were more preferred by male 41(55%) than female respondents 35 (46%). This situation was attributed to the fact that most extension officers were male and female respondents were not free to talk to them due to social-cultural barriers. More findings are presented in Figure 1

# Age Differences in Sources Used to Access Agricultural Information

A cross tabulation was made of frequently used sources of information against the age of respondents.

It was established that respondents aged 30-39 years and 40-49 years were active in using sources of information. This was probably because they needed much information from a variety of sources to enable them to carry out their farming activities efficiently and enhance production. Respondents aged 60-69 years hardly used most sources, particularly printed and electronic sources. They relied on friends and colleagues, the church and mosque, extension officers and village leaders six. Pearson's chi-square statistical tests show that there was a significant difference on preferred sources of information across age of respondents as the P-Value was either less than or equal to 0.05 for most of the frequently used sources of information. From these findings, it was established that age influences the use of sources of agricultural information. A similar trend was observed by Lwoga, (2010) and Mtega, (2012). The trend in an active farming age to access more agricultural information observed in this study is in line with studies done by Agyei and Osman (2014), Aramide et al., (2015) and Buchav (2012). Further findings indicated that there was no significance difference in access to modern farming information, pest and pets management and product packaging technology. This is probably because respondents were using their own experience. More information is indicated in Table 3.

Information Source	Frequency of Using the Source	19-29	30-39	Age 40-49	5 0-59	60-69	P-Value
Gatekeepers	Never	3(38%)	5(63%)	-	_	-	0.001
	Rarely	9(31%)	16(55%)	4(13%)	-	-	
	Often	11(11%)	46(45%)	32(31%)	6(6%)	-	
	Very often	-	2(20%)	8(80%)	-	-	
Friends/ colleagues	Never	2(67%)	1(33%)	-	-	-	0.035
	Rarely	5(33%)	6(40%)	3(20%)	5(5%)	6(6%)	
	Often	16(16%)	41(41%)	33(33%)	2(7%)	-	
	Very often	-	21(68%)	8(26%)	-	-	
Church	Never	-	11(85%)	-	27(15%)	-	0.006
/mosque	Rarely	2(13%)	7(47%)	2(13%)	1(7%)	3(3%)	
	Often	17(18%)	38(40%)	32(34%)	4(4%)	-	
	Very often	4(14%)	13(46%)	10(36%)	1 (4%)	-	
Village leaders	Never	-	6(55%)	3(27%)	2(18%)	-	0.071
	Rarely	-	2(100%)	-	-	-	
	Often	9(11%)	38(48%)	21(27%)	5(6%)	6(8%)	
	Very often	14(24%)	23(40%)	20(35%)	1(2%)	-	
Extension officers	Never	-	1(100%)	-	-	-	0.208
	Rarely	1(100%)	-	-	-	-	
	Often	8(11%)	34(47%)	19(26%)	5(7%)	6(8%)	
	Very often	14(18%)	34(45%)	25(33%)	3(4%)	-	
Radio programmes	Never	-	-	-	-	_	0.000
. 0	Rarely	5(11%)	21(45%)	13(28%)	5(11%)	6(8%)	
	Often	9(18%)	29(60%)	8(16%)	2(4%)	-	
	Very often	9(18%)	19(37%)	23(45%)	-	-	

Table 3: Relationship between Age of Respondents and Sources Used to Access Agricultural Information N=150

Further statistical analysis on the influence of age in choosing agricultural sources of information showed a significant statistical difference on; affordability of the source, format of the source and ease of use. A two-tailed Pearson Chi-Square test showed a significant difference with P- value  $\leq 05$ . On the other hand, the findings indicated that age did not influence the choice of information sources with regard to sources closeness, availability, reliability, and adequacy of information obtained from the source. This was probably because respondents relied much on informal sources of information.

Pearson's chi-square statistical tests show that there was a significant difference between average income generated per year and the sources used to access agricultural information. The P-Value was either less than or equal to 0.05. These findings are in line with Opara (2010), who noted that income is crucial in agricultural information acquisition and use because the higher the income of the farmer, the more he/she would seek information for use. With improved income earned from crop production, the farmer will be in a better position to acquire more information to improve crop production. However, most small scale crop farmers in the region are poor and have little or no access to credit facilities. Therefore, they tend to seek information from sources that are convenient, readily accessible, easy to use and require least effort. They tend to make decisions on farming activities based on their experience, their thinking and on ways that are easy, natural and convenient. This situation affects crop production in the region.

# Differences in Crop Production and Agricultural Information Services Utilized

Pearson Chi-Square Test was used to determine the relationship between crop production and agricultural information service provided. From the findings, it can safely be established that crop production is influenced by agricultural information services provided and utilized in the area of study. This depends on the type of information service provided and whether it addresses the information needs of respondents or not. For example, if respondents are provided with current awareness services, selective dissemination of information, training on farming issues, on farm reference services, technical advice, and information on how to use information sources, they can probably increase their production and vice versa. However, other agricultural information services seem not to have an effect on crop production as they show no significance difference. Te findings show that information repackaging, document delivery and routing services, CD-ROM database provision, translation services and abstracting services did not influence crop production in the study area. This is probably due to the fact that these services were not available in the study area due to either presence of few agricultural information service providers, lack of necessary skills among information service providers, poor budget allocation and prioritization on agricultural information service provision in the country. More findings are indicated in Table 4.

Information service			Pearson Chi Square	Test
	<b>X</b> <sup>2</sup>	Df	Asympt. Sign	Remarks
			(Two sided)	
On farm reference services	4.261	4	0.02	
Current awareness services	2.131	4	0.03	P-Value ≤.005
Selective dissemination of information	3.211	4	0.02	Significant
Instant messaging through mobile phones	14.597	4	0.05	Difference
Technical advise	3.786	4	0.01	
Instruction on how to use the sources	1.801	4	0.04	
Training on different farming issues	6.558	4	0.05	
Information repackaging	1.892	4	0.35	
Document delivery service	2.351	4	0.85	P-Value ≥ $.005$
Routing of documents on new innovations	7.165	4	0.37	
Photocopies of available literature	5.558	4	0.32	No Significance
CD-ROM database provision i.e AGRICOLA	3.118	4	0.53	Difference
Translation services of available literature	1.061	4	0.90	
Information referral services	5.589	4	0.93	
Abstracting services	1.862	4	0.93	

Table 4: Relationship between Crop Production and Agricultural Information Services Provided N=150

Proposed Strategies to Minimize the Influence of Socialdemographic Differences in Accessing and Using Agricultural Information Services The findings show that social-demographic characteristics of respondents have an influence on access to and use of agricultural information. Smallscale crop farmers are the primary consumers of agricultural information services. In this regard, the following strategies are proposed to improve access to and use of agricultural information services.

Small-scale crop farmers should be receiving transcribed, translated and repackaged information from professional information service providers in print and electronic format bearing in mind their social-demographic differences. Agricultural information systems, services, and resources should be coordinated and should consider socialdemographic characteristics of small scale crop farmers. In order to facilitate effective access to and use of agricultural information service provision, there should be a centralized agricultural database management system to collect, organize, translate and disseminate agricultural information to small-scale crop farmers countrywide based on their information needs and social-demographic differences. The government, in collaboration with information experts like librarians, database management experts, social media experts and IT experts should ensure that all aspects related to agricultural information service provision are properly managed to meet the dynamic needs of the farming community in the country. In addition, agricultural institutions, curriculum developers, and information experts should work together to develop long term and short term courses in agricultural information management to acquaint information service providers with necessary knowledge and skills in agricultural information service provision.

# **Conclusion and Recommendations**

The study established that demographic characteristics of respondents influence agricultural information service provision. Statistical tests (Chisquare) show that there was a significant difference statistically between demographic characteristics of respondents such as age, gender, education level, farm yield and income per year and various aspects related to access and use of agricultural information service. Based on the findings it is therefore recommended that the existing agricultural information systems, services, and sources should be reviewed with a focus on physical, human, financial, practical, theoretical gaps and above all the socialdemographic differences of farmers. The study, therefore, emphasizes on collecting, processing, organizing and preserving agricultural information in a centralized database system for to simplify the process of accessing and using it. Finally, the findings of this study may be used to design user-friendly agricultural information systems and services which focus on social-demographic differences of small scale farmers.

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# Information Literacy Skills and Competencies among University Students: A Pilot Study at Tumkur University, Karnataka

#### Hemavathi B.N.\*, Ramesha\*\*

#### Abstract

The purpose of this paper is to assess and determine the information literacy skills among the postgraduate students of Tumkur University, Karnataka. The present study has made an attempt to study the skills and the competencies required in locating, searching, evaluating and in the ethical use of information among the postgraduate students of Tumkur University. Structured questionnaires were randomly distributed among the students of postgraduate departments which are located in the Tumkur University Campus, Tumakuru. The postgraduate students of the academic year 2015-2016 were considered for the study. 300 filled questionnaires were received and same has been recorded in MS Excel for data analysis. The paper reveals that, very less number of postgraduate students are looking information to be familiar with the current developments in their subject and Searching techniques and search approaches are exists among them. But the study has evidenced the poor level of skills and competency in locating, evaluating and in the ethical use of information among the postgraduate students of Tumkur University. The paper suggested to practicing library and information professionals of Tumkur University to strengthen their efforts to educate the postgraduate students on the skills required for them to locate, search, evaluate and use information ethically, which is essential for their academic activities.

Keywords: Information Literacy; Information Literacy Skills; Information Literacy Competencies; Tumkur University; Postgraduate Students.

#### Introduction

Information literacy (IL) is set of abilities requiring individuals to 'recognize when information is needed and have the ability to locate evaluation and use effectively the needed information' (ALA Presidential Committee on Information Literacy: final report, 1989). Information Literacy is increasingly important in the contemporary environment of rapid

Received on 14.03.2017, Accepted on 25.03.2017

technological change and proliferating information resources. Because of the escalating complexity of this environment, individuals are faced with diverse, abundant information choices in their day-to-day life. Along with the awareness on different information sources, learners must have set of skills and abilities required for optimum utilization of the great quantity of information which is available in media including textual, graphical and aural.

#### Definition

The Alexandria Proclamation of 2005 describes information literacy and lifelong learning as the "beacons of the Information Society, illuminating the courses to development, prosperity and freedom. Information literacy empowers people in all walks of life to seek, evaluate, use and create information effectively to achieve their personal, social, occupational and educational goals. It is a basic human right in a digital world and promotes social inclusion in all nations." As said by ACRL (2000) Information Literacy forms the basis for lifelong

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learning. 'Information literacy is common to all disciplines, to all learning environments and to all levels of education. It enables learners to master content and extend their investigations become more self-directed and assumes greater control over their own learning and an information literate individual is able to 'determine the extent of information needed, access the needed information effectively and efficiently, develop effective information search strategies, locate and retrieve its sources, organize, synthesize, use and apply information, incorporate selected information into one's knowledge base, use information effectively to accomplish a specific purpose, understand the economic, legal and social issues surrounding the use of information and access and use information ethically and legally'.

# Literature Review

Developing lifelong learners is central to the mission of higher education institutions like universities. By ensuring that individuals have the intellectual abilities of reasoning and critical thinking, and by helping them construct a framework for learning how to learn, colleges and universities provide the foundation for continued growth throughout their careers, as well as in their roles as informed citizens and members of communities. Gaining skills in information literacy multiplies the opportunities for students' self-directed learning, as they become engaged in using a wide variety of information sources to expand their knowledge, ask informed questions, and sharpen their critical thinking for further self-directed learning. ACRL (Framework for information literacy for higher education 2016).

Saeid Baroutiana and Barbara Kensington-Millerb (2015) were examined the usefulness of integrating information literacy as an auxiliary workshop into a postgraduate Food Processing course, with the focus on course and subject related information. The results indicated improvements in the students' information literacy skills with the slight increase in their confidence level too. Mugyabuso J. F. Lwehabura, M J F (2016) assessed the information literacy skills among 1<sup>st</sup> year postgraduate students at Sokoine University of Agriculture Tanzania with the aim of determine the challenges and problems facing by them in terms of searching and user of various information sources. The findings revealed that good number of students demonstrated significant deficiency in their

information literacy knowledge and skills further the author recommended to introduce the information literacy course mandatorily for postgraduate and undergraduate students to become an effective independent learners.

# Need and Purpose of the Study

Information literacy makes students to achieve their academic objectives, expand their knowledge and capability, and play multi-disciplinary role in the present knowledge society. The students with information literacy skills can approach to the required information accurately and timely. They can evaluate information competently and use information precisely and productively. To enhance the quality in the student's performance in their academic activities and growth of their knowledge, information literacy is very much essential. No such type of study has been carried out to assess and evaluate the information literacy skills among postgraduate students of Tumkur University, Tumakuru. With this background the present paper has made an attempt study the student's skills in locating, searching, evaluating and in the ethical use of needed information in their academic activities.

# **Objectives of the Study**

To find out the postgraduate students awareness and competency in:

- Identifying the sources of needed information
- Searching of needed information on world wide web
- Evaluation of obtained information from different information sources
- Ethical use of information

# Methodology

The present study adopted the survey method. Structured questionnaires were distributed randomly among the students of postgraduate departments which are located in the Tumkur University campus, Tumakuru. The postgraduate students of the academic year 2015-2016 of postgraduate departments of Tumkur University were considered for the study. The sampling technique given by Krejcie, Robert V and Morgan, Daryle W (1970) [3] has been used to draw the sample size. The study population is 1300 out of which 297 were the sample size rounded to 300 and 300 filled questionnaires were received and same has been recorded in MS Excel for data analysis.

#### Analysis and Interpretation of Data

#### Demographic Details of the Respondents

300 postgraduate students were took part in the

Table 1: Demographic details of the respondents

present study, among them 48.3% of male and 51.7% of female students. Among them 74% of the students are from rural background and 26% of students are from urban background. All the students are belongs to the age group of 21-25.

Students' Skills and Competency in the Locating of Information

The questionnaire sought to establish what

Demographic Informatio	n	Responses	percentage
Gender	Male	145	48.3%
	Female	155	51.7%
Social Background	Urban	78	26%
2	Rural	222	74%
Age group	21-25	300	100%

Table 2: Students skills in locating needed information

Criteria	Preferred Information Sources	Responses	percentage
To find the	Dictionaries	116	38.7
meaning of a word	Text books	140	46.7
	Encyclopedias	58	19.3
	Internet	111	37
	Consult teachers	66	20
	Consult library staff	31	10.3
To get information for day-to-day life	Newspaper	125	41.7
or general information	Internet	137	45.7
	By watching TV	83	27.7
	Friends	114	38
	Journals	72	24
	By listening Radio	41	13.7
To get recent information on their	Journals	106	35.3
interested topic	Books	150	50
	Encyclopedias	43	14.3
	Newspaper	127	42.3
	Dictionaries	60	20
	Consult teacher	34	11.3
Part of a research article preferred to	Abstract	113	37.7
know the relevance of interested	Introduction	153	51.0
topic	Methodology	80	26.7
-	Findings/Results	81	27.0
	references	91	30.3

information sources the students use in the meeting of their day-to-day (general) information needs to specific information needs. Data presented in the Table 2.

The findings revealed that, 41.7% of students preferred newspaper, 45.7% of students were preferred internet, 27.7% of students were preferred watching TV, 38% of students preferred friends, 24% of students preferred journals and 13.7% of students preferred listening radio as source to get general information or information for day-to-day life. The

findings further revealed that, to find the meaning of a word 38.7 per cent of students preferred dictionaries, 46.7% of students were preferred textbooks, 19.3% of students were preferred encyclopedia, 37% of students preferred internet, 20% of students were agreed that they will consult teachers and 10.3% of students will consult library staff. To get recent information on information technology 35.5% of the students were preferred journals, 50% of the students were preferred books, 14.3% of students were preferred encyclopedia, 42.3% of students preferred newspaper 20% of students were preferred dictionaries and 11.3% of

students preferred to consult teacher as source of information.

The findings also revealed about the part of a research article preferred by the students to know the relevance of their interested topic, 37.7% of the students were preferred abstract, 51% of the students were preferred introduction, 26.7% of students were preferred methodology, 27% of students were preferred finding or results and references were

preferred by 30.3% of the students. The majority of the students were preferred introduction part of a research article to know the relevance of their topic. This shows the lack of awareness and lack of skills in the locating of needed information.

Information Searching Techniques used by the Students

The present trend influence the learners to obtain skills needed to search needed information in in the

Table (	3:	Information	searching	technique	s and	search	approaches	preferred b	v the stuc	lents
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Preferred Information Search techniques and Search Approaches		Responses	Percentage
Search techniques	Phrase Search	235	78.3
-	Wildcard search	83	27.7
	Boolean search	126	42
	Advanced search	164	54.7
Search approaches	Author Approach	249	83
	Title Approach	187	62.3
	Keyword Approach	123	41
	Subject Approach	159	53
	Publisher Approach	76	25.3
	Standard Number Approach	81	27

abundance of print and electronic information resources. At attempt has been made to study the search techniques and search approaches preferred by the postgraduate students of Tumkur University. Data presented in the Table 3.

The study results revealed that, 78.3% of students were used phrase search, 27.7% of students were preferred wildcard search, 42% of students were preferred Boolean search technique (AND, OR, NOT) and 54.7% of students preferred advanced search techniques to search information in networked environment. Concerning the search approaches preferred by the students to search needed information in the networked environment findings of the study revealed that, 83% of students were preferred author approach, 62% students were

preferred title approach, 53% of students were preferred subject approach, 41% of the students were preferred keyword approach, an average of 26% of students were preferred publisher and standard number approaches to search a book or information in a library catalogue/OPAC/WebOPAC /WWW. This shows that the postgraduate students of Tumkur University are using different search strategies and different search approaches to search and retrieve information in networked environment.

# Evaluation of Information

An information literate person must know to evaluate the information before he/she use. The

 Table 4: Students skills and competency in the evaluation of information resources

Evaluation Criteria preferred by the students to evaluate print and electronic information resources		Responses	Percentage
For Print information	The timeliness of the information	175	58.3
sources	The credentials of the author/s	177	59
	The length of the information	227	75.7
	The accuracy of the information	140	46.7
For Electronic	The Date of publication is provided	117	39
information sources	The author/authority	141	47
	Attractiveness/colors	184	61.3
	The site which is easy accessible	184	61.3
	Domain name (.org/.com/.edu/)	207	69
	Flashing of information / more picture	95	31.7
	Responsibility for the site is clearly indicated	73	24.3

present study has been made an attempt to study the evaluation criteria preferred by the postgraduate student of Tumkur University in the evaluation of information available in print and electronic format. Data presented in the Table 4.

75.7% of students were chosen the length of information source, 59% of the students were chosen the credentials of the authors, 58.3% of the students were chosen the timeliness of the information, and 46.7% of students chosen the accuracy of information as an evaluation criterion to evaluate the print sources of information. Concerning with the evaluation of electronic information resources the findings revealed that, 39% of students are considering the date of publication, 47% of students considering the author/

authority as an evaluation criteria, 61.3% of students are considering the website easily accessible and attractive and colorfulness of website as an evaluation criteria, 69% of students are considering the domain of websites such as .edu, .org and .com etc., 31.7% of students considering the websites which contains flashing of information or contain more pictures and 24.3% of the students are considering the clear indication of the responsibility for the site as evaluation criteria to evaluate the electronic information sources. This shows the poor competency level among the postgraduate students in the evaluation of information resources.

**Table 5:** Student's awareness in the ethical use of information

Postgraduate student's skills and competency in the ethical use of information		Responses	Percentage
Do you know about the Citation?	Yes	210	70
Do you know about the referencing	Yes	237	30 79
standard/ style manual?	No	63	21
Style manuals used by postgraduate students	CHICAGO	46	57 15.3
	MLA	88	29.3
Postgraduate student's awareness on Plagiarism?	Extremely Aware Very Aware	30 59	10 19.7
C C	Moderately Aware	98 21	32.7
	I don't know	31	27.3

#### Ethical Use of Information

Use of information ethically is one of the characteristics of information literate person. The present study has been made an attempt to study the postgraduate student's awareness in the ethical use of information. Data presented in the Table 5.

The findings of the study revealed that, 70% of the students know about the citation. 79% of the students are known about the referencing standard or style manual. 57% of students are using APA style manual, 15.3% of students are using MLA Style Manual and 29.3% of students are using MLA Style Manual and 10% of the postgraduate students are extremely aware, 19.7% of students are very aware, 32.7% of the students are moderately aware, 10.3% of students are slightly aware and 27.3% of the students are doesn't know about the plagiarism. This shows the poor competency in the ethical use of information among the postgraduate students.

# Information Literacy Program at Tumkur University

existence of information literacy program. Hence students were asked about the same. 50.3% (151) students were said yes and 49.7% (149) students were said no for the question 'Is your University library is conducting any IL Program?' For the question 'Do you expect information literacy program to use information ethically and effectively?' 76.3% (229) of students are said yes and 23.7% (71) students were said no for the same.

#### **Findings and Discussion**

- The majority of the students are from rural background
- The Majority of the students are preferred textbooks, dictionaries and search internet to find the meaning of the word, though dictionaries are the preferred source to know the meaning of a word students preferred different sources.
- The Majority of students preferred internet as sources to get information from day to day life

The study has been made an attempt to know the

and radio is least preferred sources. Though the newspapers and TV are best in providing information for day to day life, students were preferred different sources to gather information about day to day life.

- Though the journals are the primary platform to communicate the updates and recent trends in a particular subject or professional trend, only 35.3% of students are given preferences to journals as a source to get recent information on Nano Technology. The Majority of students preferred books and newspapers as sources to get recent information on Nano technology. It evidences lack of awareness about information sources among the students.
- The majority of the students were chosen the introduction part, an average of 28% of students were chosen the methodology, finding/results and references of an article to understand the relevance of the article on their interested topic.

The above findings of the study reveal that, very less number of students are having an awareness of different kinds of information sources and the majority of the students are very poor in locating the needed information.

- Majority of the students are preferred phrase search technique and advanced search techniques to retrieve information in online and author and title approaches are preferred search approaches to search information in a library catalogue/OPAC/WebOPAC/WWW.
- The Majority of the students were chosen the length of information as an evaluation criteria and the accuracy of information considered as an evaluation criteria by the least number of students to evaluate the print information sources.
- The Majority of students considered the domain of websites, the website which is easily accessible and attractiveness of websites as an evaluation criterion to evaluate the e resources and less No. of students were considered the authority/author and responsibility of the website as an evaluation criterion to evaluate the online information sources.

It clearly indicates that the students' skills and competency level is poor in the evaluation of print as well as electronic information sources.

 Majority of the students were does not know about the citation. APA style manual is popularly used by the postgraduate students and the majority of the postgraduate students don't know about the plagiarism.

• Information literacy is exists as said by the majority of the respondents and 76.3% of respondents are opined as they need information literacy program for ethical and effective use of information.

# Suggestions and Conclusion

- Information literacy skills should be taught in Tumkur University.
- There is a need to create awareness on different types of information sources and their purpose. (primary, secondary and tertiary)
- Student's skills in the evaluation of information sources are poor. There is need to create awareness among the postgraduate students to evaluate the information available in print as well as electronic format.
- Students' skill in the ethical use of information is poor. To protect oneself against the charges of plagiarism there is a need to create awareness on plagiarism and also there is a need for training programs to educate the postgraduate students about referencing, use of style manuals, citation and software aspects related these areas.

# Conclusion

Information literacy skills are of prime importance in order to achieve everyone's academic goals. Information literacy is essential for students in order to succeed academically and in their future professional opportunities. Educating our younger generation with the information literacy skills, leads towards the development of information literate society. The practicing LIS professionals are recognized as information managers, they need to take step towards imparting the information literacy skills among the younger generation to contribute their efforts in the building of information literate society. It is suggested to Tumkur University library to conduct information literacy programs to strengthen its users for the optimum utilization of information sources.

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# Exploitation of Web 2.0 Based Website among the Female Students of University of Rajshahi: A Case Study

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# Abstract

The present study mainly explores the usage of Web2.0 based website among female students of Rajshahi University, Bangladesh. The study revealed that the term web 2.0 has popularity among 73 respondents (97.33%). Majority respondents i.e.70.67% has used web 2.0 based websites whereas 29.33% respondents don't use the web 2.0 based website. The present study also find that 32.07% respondent think that web 2.0 based applications is important, and 26.41% respondents are fully satisfied with the web 2.0 based websites. It has been found that 41.51% respondents always visited website for the purpose of social networking information whereas 39.62% respondents never visited website for the same purpose.

Keyword: Web 2.0; Social Networking Site; Blog; Rajshahi University.

# Introducation

University of Rajshahi is one of the largest Universities in the country and the largest with the highest seat of learning in the northern region of Bangladesh. Presently it has 56 departments, 10 faculties, 6 institutes, 25000 students (approximately) [1].

The Web has become a reference that occurs everywhere, and almost everyone knows about it. The web has grown rapidly over time beginning in the early 1990s and has since changed from the traditional (Web 1.0) for the second generation Web (Web 2.0). The Web 2.0 described as a model of World Wide Web sites that emphasize on the content built by users (user-generated content), usability and interoperability. The Web 2.0 shows the new version of the World Wide Web, although it does not refer to any renewal of the technical specifications, to change in the way web pages are created and used. The Web 2.0 is the next generation of the web applications that

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Received on 10.05.2017, Accepted on 27.05.2017

are more active and participative [2].

The term "Web 2.0" was first used in January 1999 by Darcy DiNucci, a consultant on electronic information design (information architecture) in her article, "Fragmented Future". Web 2.0 is the term given to describe a second generation of the World Wide Web that is focused on the ability for people to collaborate and share information online. Web 2.0 basically refers to the transition from static HTML Web pages to a more dynamic Web that is more organized and is based on serving Web applications to users [3, 4].

# **Objectives of the Study**

This study has been carried out with a view to the following objectives:

- To determine nature, purpose and method of web 2.0 based website usage;
- To explore the motivations in using Web 2.0 based websites
- To explore the pros and cons of web 2.0 based website resources;
- To find out the benefit of web 2.0 based website;
- To discover the level of satisfaction over web 2.0.

# Materials and Methods

The survey method was used to acquire the data

from the respondents. Total 100 questionnaires were distributed to the selected female respondents. Out of 100 respondents, 75 questionnaires (75%) were returned to the researcher to conduct the study. The questionnaire was formulated with both open and closed-ended questions. All the collected data has been analyzed by tables and figures with the help of modern statistical method.

#### Literature Review

Dasgupta, Diptiman and Dasgupta, Rudranil (2009) highlight the pattern and behavior of different social networks and how they are implemented using Web 2.0. They have also indicated how behavior of individuals and their network can be extracted and analyzed by studying different social networks. Towards the end of this article we highlight the future of Web 2.0 and how its enhanced capabilities can make social networks more mature with added features and functionalities to improve the efficiency of social collaboration [5].

Cha (2010) mentions that online privacy concerns are a deterrent for the frequency of using social media sites. Thus privacy concerns are a barrier for using the Internet and social media sites. He suggests that it is essential for social networking site operators to ensure online privacy to turn potential users into regular users of their sites because potential users will be reluctant to register for, and continue to log into, social networking sites on a regular basis if they fear privacy infringement [6].

Virkus (2008) stresses that social media helps promote the benefits of working co-operatively with tools that facilitate the aggregation and organization of knowledge while at the same time demonstrating that the diversity of individual research interests enhances learning for all. It helps students develop practical research skills that they need in a world where knowledge construction and dissemination make increasing use of online information networks. Thus this social media is suitable for educational and lifelong learning purposes in our knowledge society, because our modern society is built to a large degree on digital environments of work and social communication [7].

Zakaria, Watson, and Edwards (2010) believe that social media applications have already being accepted by younger generations as a platform to socialize, collaborate and learn in an informal and flexible manner, although their level of Involvement and contribution varies significantly [15]. Si, Shi and Chen (2009) find in their study that at least two-thirds (20 out of 30) of Chinese university libraries deployed one or more Web 2.0 technologies; only one-tenth adopting 4 kinds of Web 2.0 technologies; RSS is applied most widely and Wiki the least [8].

Shao and Seif (2014) identify that Wikipedia (15.9%), Facebook (15.6%), Google (14.6%) and Youtube (14.5%) are often used by students. The students seems to be equipped with latest web 2.0 tools and skills [9].

Widyasari, Nugroho and Permanasari (2016) indicate in their study that users use more actively of the Web 2.0 technologies (e.g. social media) as part of lives and their culture. The overall respondents know about what is meant by the Web 2.0 technologies, but only 0.5% who do not want to use it. The survey showed that 49.5% respondents use 4 to 6 types of social media, 28.8% respondents use a 1 to 3 types and 16.7% respondents use 6 to 10 types of social media. The survey shows that the utilization of the Web 2.0 technologies, in this case, are to obtain information, to make social interaction and also to interact with fellow students and educators. There are some perceived benefit students in using web 2.0 technologies. This technology helps to get information. Students are assisted in sharing information, knowledge and learning materials. The use of this technology facilitates and speeds up communication between students and lecturers [10].

Eze (2016) finds in his article Awareness and use of Web 2.0 tools by LIS Students at University of Nigeria that students are quite familiar with some Web 2.0 tools such as Social networking sites, Instant Messaging, blogs and Wikis, while, they are not familiar with tools such as RSS feeds, Podcasts, and social bookmarks. The study revealed that the most frequently used Web 2.0 tool was Facebook, followed by YouTube and Wikis. On the other hand, the results showed little use of tools such as Flickr, Podcast, RSS feeds, and Social bookmarks [11].

#### **Results and Discussion**

Data analysis has been broken into different parts for the purpose of easy analysis supported by tables and graphs.

# Web 2.0 Basics

Respondents were asked to indicate the popularity of the term web 2.0. Figure 1 represents that almost all of the respondents (97%) know the term Web 2.0 and only 3% respondents don't know exactly what the term meant web 2.0. Those who are known with the term web 2.0 are asked to indicate the meaning of the term by providing six meaning, which are equally or in some cases partially correct answer. Table 1 indicates that social networking sites (84.33%), and web technologies where people bring content, collaborate and share information online (84%) are the most stable answer among the respondents and 17.33% of the respondents don't have clear idea regarding the meaning of the term.

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Figure 2 shows that majority percent of the respondents (71 %) use web 2.0 based websites and 29 % respondents don't use web 2.0 based websites. Respondents who use web 2.0 based websites were further asked to indicate their frequencies in using web 2.0 based websites. Table 7 reveals that 43.39% respondents always use web 2.0 based web sites while it have been rarely used by 6% of the respondents. Those who are used to web 2.0 based applications were asked to indicate their learning process of web 2.0 based applications. Table 3 shows that friend and professionals (64.15%) and self-learning (20.75%) have been playing important roles in their learning system.

There are 22 respondents under current study who are not using web 2.0 based websites. Respondents were asked to indicate the reasons for not using web 2.0 based websites. In fact maximum numbers of respondents think that web 2.0 based websites are not required at all (95.45%) while majority percent respondents are also not so much interested on it (86.36%).



Fig. 2: Usage of web 2.0 based websites

Importance of Web 2.0 based applications



Fig. 3: Importance of Web 2.0 based applications



Fig. 4: Satisfaction level with Web 2.0 based websites

# Exploitation of Web 2.0

Table 5 shows that 73.58% respondents always use Facebook, 13.21% respondents sometimes use twitter, 50.94% respondents sometimes use YouTube, 16.98% respondents sometime use Wikipedia, 30.19% respondents sometimes use Google AdSense, 7.55% respondents sometime use Bikroy.com and 24.53% respondent sometime use Skype. While cent percent respondents under survey don't use Flickr, Blogger, Scribd, Slide share, RSS feeds, LinkedIn, My space like web applications.

Table 6 depicts that 96.23% respondents have personal Facebook account, 35.85% respondents have maintained Mail group, and 24.53% respondents have Skype account. All the respondents have no LinkedIn account. Table 7 shows that forum (100%), news feeds (83.02 %), wikis (73.58%), file sharing (60.38%) and blogs (22.64%) based applications are more effective in study and research. All respondent think
podcasting is less effective in study and research. Figure 3 demonstrate that 13% respondents think web 2.0 is very important, 32% respondents think web 2.0 is important, 25% respondents think web 2.0 is somewhat important and 30% respondents think web 2.0 is not so much important.

## Motivations for Using Web 2.0

Table 8 shows that 28.30% respondents sometimes visited web 2.0 based websites for preparing assignment. 45.28% respondents sometime visited web 2.0 based websites for pursuing research work. 20.75% respondents always reading e-newspaper through web 2.0 based websites. 24.53% respondent sometime visited for getting a result in relating to job searching and application. A number of respondents always visited web 2.0 based websites for mailing (13.21%), group mailing (11.32%), chatting (39.62%), and social networking (41.51%). A good number of respondents sometimes visited web 2.0 based websites for downloading music/movie (39.62%), watching streaming video (60.38%), sharing image (43.39%). 16.98% respondents always visited web 2.0 based websites for getting information from wiki.

#### Evaluation

Table 9 shows that "spread information faster than previous (32.07%)", "facilitate political change by stimulating democratic thinking (28.30%)" and "allow for quick and easy dissemination of information (50.94%)" are the positives sides of web 2.0 based websites what the respondents strongly agreed. Respondents of our current study strongly believe that "Enables the spread of false and reliable information simultaneously (100%)", "Create a new horizon of fraud and embezzlement (3.77%)", "Tend the student to have lower grade (12%)", "Facilitate inappropriate relationship among the members of its users (32.07%)" are the negative sides of web 2.0 based websites.

Table 10 represents that a good number of respondents think web 2.0 based websites have extreme impact on social activities (30.19%), educational activities (35.84%), and Research activities (58.49%). Figure 4 reflects the satisfaction level with Web 2.0 based websites. 26% respondents are fully satisfied, 49% respondents are partially satisfied, 21% respondents are less satisfied and 4% respondents are not at all satisfied.

 Table 1: Meaning of the term Web 2.0

	Meaning of the term	Web 2.0			Respon (Number and	dents Percentage)
	Second generation of web technologies				32 (42.67%)	
	Social networking	sites			64 (84.33%)	
Web technologies where people bring content ,collaborate and share information online				63 (84	1%)	
Smart way of intera	active sharing informatior	n with each ot	her through o	online	43 (57.	67%)
New ge	neration of dynamic web	site creation	process		26 (34.	67%)
	Read-write web envi	ronment			-	
	I don't have clear	idea			13 (17.	33%)
(N.B. Impact scale: 1=Extrem	mely, 2=Very, 3=Somew	hat , 4= Not	at all)			
Table 2: Freque	ncy in using web 2.0 bas	sed websites				
Web 2.0 usag	e frequency	1	2	3	4	
Respon	dents	23	17	7	6	
(Number and	Percentage) (4	43.39%)	(32.07%)	(13.21%)	(11.32)	%)
(N.B. Usage freq	uency: 1=Always, 2=Freq	uently, 3=Son	ietimes, 4= Ra	rely)		
Table 3 Learning system	of web 2.0 based applica	ations				
Learning system	Self-learning	Online	tutorial	Friend and professionals	Formal training	Total
Respondents ( Number and Percentage	11 (20.75%)	-		34 (64.15%)	8 (15.09%)	53 (100%)
Table 4: 1	Reasons for not using we	eb 2.0 based	websites			
Reason	s for not using web 2.0 b	ased website	s Responde	ents ( Number and I	'ercentage)	
	Not so much interest	ed		19 (86.36%)		
	Unknown technolog	5y		-		
	Not required at all			21 (95.45%)		
	Complexity			3 (13.64%)		
	Financial problems	5		4 (18.18%)		
	Less infrastructural fac	ility		-		

Web applications		Usage frequency			
	1	2	3	4	
Facebook	39 (73.58%)	_	12(22.64%)	2(3.77%)	
Twitter	_	_	7(13.21%)	46(86.79%)	
Flickr	-	-	-	53(100%)	
YouTube	-	-	27(50.94%)	26(49.06%)	
Blogger	-	-	-	53(100%)	
Wikipedia	-	-	9(16.98%)	44(83.02%)	
Scribd	-	-	-	53(100%)	
Slide share	-	-	-	53(100%)	
RSS feeds	-	-	-	53(100%)	
LinkedIn	-	-	-	53(100%)	
Google AdSense	-	-	16(30.19%)	37(69.81%)	
Bikroy.com	-	-	4(7.55%)	49(92.45%)	
My space	-	-	-	53(100%)	
Skype	-	-	13(24.53%)	40(75.47%)	

Table 5:	Usage of	Web 2.0	based	web	applications
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(N.B. Usage frequency: 1=Always, 2=Frequently, 3=Sometimes, 4= Never)

## Table 6: Possession of personal account

Possession of Account	Yes	No	Yes but now remain closed
Personal Blog	-	53(100%)	-
Facebook/twitter/google+ Account	51(96.23%)	_	2(3.77%)
LinkedIn Account	-	53(100%)	-
Mail group	19(35.85%)	34(64.15%)	-
Skype Account	13(24.53%)	40(75.47%)	-

Table 7: Effectiveness of Web2.0 for study and research

Web 2.0 based application	Frequency of effectiveness				
	More effective	Effective	Less effective	Ineffective	
Blogs	12 (22.64%)	28 (52.83%)	13 (24.53%)	_	
File sharing	32 (60.38%)	21 (39.62%)	_	_	
Bookmarking/ Tagging	_	24 (45.28%)	29 (57.72%)	_	
Forums	53 (100%)	_	_	_	
News feeds	44 (83.02%)	9 (16.98%)	_	_	
Podcasting	_	_	53 (100%)	_	
Wikis	39 (73.58%)	14 (26.42%)	_	_	
Instant Messaging	_	43 (81.13%)	10 (18.87%)	_	
Social Networking Site	1(1.87%)	52 (98.11%)	_	_	

(N.B. Effectiveness scale: 1=More effective, 2=Effective, 3=Less effective, 4= Ineffective)

#### Table 8: Purpose in using web 2.0 based websites

Rationality by sectors	Usage frequency			
	1	2	3	4
Study				
Preparing Assignment	5(9.43%)	9(16.98%)	15(28.30%)	24(45.28%)
Pursuing research work	_	_	24(45.28%)	29(54.72%)
Seeking educational information	_	_	_	53(100%)
Continuing online course/training	_	_	_	53(100%)
Reading e-book/e-journal/e-newspaper	11(20.75%)	_	8(15.09%)	34(64.15%)
Job Searching & Applying				
Searching for a job	_	_	_	53(100%)
Applying for a post	_	_	_	53(100%)
Getting a result	_	_	13(24.53%)	40(75.47%)
Continuing online training	_	_	_	53(100%)
Communication & Social Networking				
E-mailing	7(13.21%)		19(35.85%)	27(50.94%)
Group e-mailing	6(11.32%)	3(5.66%)	12(22.64%)	32(60.38%)
Blogging	· · /	· /	、	53(100%)
Chatting	21(39.62%)	_	15(28.30%)	17(32.07%)
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Video-conferencing	_	_	13(24.53%)	40(75.47%)
Social networking	22(41.51%)	_	10(18.86%)	21(39.62%)
Online voice call		_	_ /	53(100%)
Instant messaging	_	_	_	53(100%)
Using Web SMS				53(100%)
Web voting/polling	_	_	_	53(100%)
Social bookmarking/tagging	_	-	38(71.69%)	15(28.30%)
Recreation				
Playing games	_	_	_	53(100%)
Downloading music/movie	13(24.52%)	_	21(39.62%)	19(35.45%)
Seeking sports news/inf.	_	_	_	53(100%)
Watching online live TV	_	_	_	53(100%)
Reading e-magazine	_	_	_	53(100%)
Listening online FM radio	_	_	_	53(100%)
Watching streaming video	_	_	32(60.38%)	21(39.62%)
Sharing image	_	_	23(43.39%)	30(56.60%)
<b>Business &amp; Financial Application</b>				
Buying/selling products	_	_	_	53(100%)
Online money earning	_	_	_	53(100%)
Online business	_	_	_	53(100%)
e-commerce	_	_	_	53(100%)
Enterprise social software	_	_	_	53(100%)
Searching News & Information				
Scaling current timely and partiant inf				52(100%)
Cetting information from wiki	0(16.08%)	-	25(4717%)	10(25.85%)
Using DSC food	9(10.96%)	-	23(47.17 %)	19(55.65%)
Catting anling norms	-	-	-	53(100%)
Line and a men	-	-	-	55(100%)
Using online map	-	-	-	53(100%)
Statistical information	-	-	-	55(100%)
Others				
Spreading information to the mass people	_	_	_	53(100%)
Building a platform for collaborative work	_	_	_	53(100%)
Communities of interest	_	_	_	53(100%)
Online health care	_	_	_	53(100%)
Online agriculture help	_		_	53(100%)
Download open source and free software	-	_	_	53(100%)
Dating Application	-	_	_	53(100%)
For collaborating, file sharing	-	_	_	53(100%)
Adult content	_	_	_	53(100%)

(N.B. Rationality scale: 1=Always visited, 2=Frequently visited, 3=Sometimes visited, 4= Never visited)

 Table 9: Positive and Negative Sides of Web 2.0 based websites

Positive and Negative Sides of Web 2.0 Application	Rating Scale			
с	1	2	3	4
Pros				
Spread information faster than previous	17(32.07%)	36(67.92%)	_	_
Help students to make the study and research easier	_	53(100%)	_	_
Allow people to improve their relationships and make new friends	_	53(100%)	_	_
Help employers find employees and job-seekers find jobs	_	53(100%)	_	_
Increase quality of life by growing level of confidence and self - esteem	_	3(4%)	50(94.33%)	_
Facilitate face to face interaction	_	53(1000%)	_	_
Allow people to create, connect, converse, vote and share information	_	53(100%)	_	_
Facilitate political change by stimulating democratic thinking	15(28.30%)	38(71.69%)	_	_
Good for the economy	_	53(100%)		_
Empower individual to make social change	_	53(100%)		_
Connected socially isolated and shy people	_	46(86.79%)	7(13.21%)	_
Allow for quick and easy dissemination of information	27(50.94%)	26(49.06%)	_	_
Provide a wider academic research to a greater audience	_	47(88.68%)	6(11.32%)	_
Offer teachers and students for collaboration outside the classroom	_	53(100%)	_	_
Brings people together to communicate, learn and share	_	53(100%)	_	_
Forms a platform to moot and regulate ideas	_	53(100%)	_	_
Provides a flow of information dissemination online	_	53(100%)	_	_
Assist in creating online resources	_	53(100%)	_	_

Cons				
Enables the spread of false and reliable information simultaneously	53(100%)	_	_	_
Lack of privacy and expose users to Govt. and corporate industries	_	53(100%)	_	_
Entice people to waste time and labor	_	53(100%)	_	_
Can harm job stability and employment	_	26(49.06%)	27(50.94%)	_
Correlated with personality and brain disorder	_	53(100%)	_	_
Promote criminal activities	_	53(100%)	_	_
Create a new horizon of fraud and embezzlement	2(3.77%)	51(96.23%)	_	_
Vulnerable position to security attack e.g. hacking, identity theft and virus	_	53(100%)	_	_
Tend the student to have lower grade	9(12%)	44(83.02%)	_	_
Facilitate inappropriate relationship among the members of its users	17(32.07%)	36(67.92%)	-	_
Over sharing of information creates more knowledge explosion	_	53(100%)		_
Information access become more complicated	_	53(100%)	_	_

(N.B. Positive and Negative scale: 1=Strongly Agree, 2=Agree, 3=Somewhat Agree, 4= Strongly Disagree)

Table 10: Impact of web 2.0 based websites

Criteria		Rating Scale		
	1	2 ັ	3	4
Educational Activities	19 (35.84%)	27 (50.94%)	7 (13.21%)	_
Research Activities	31 (58.49%)	22 (41.51%)	_	_
Communication Activities	3 (5.66%)	44 (83.02%)	7 (13.21%)	_
Entertainment Activities	9 (16.98%)	36 (67.92%)	8 (15.09%)	_
Social Activities	16 (30.19%)	37 (69.81%)	_	_

(N.B. Impact scale: 1=Extremely, 2=Very, 3=Somewhat , 4= Not at all)

#### Conclusion

Web 2.0 has brought a change to how we communicate and disseminate information with the use of Twitter, Facebook, YouTube, instant messaging and blogging. The use of this technology in the learning process is still focused on personal communications, like as informal communication is done in general.

Implementation of Web 2.0 in organizations that have the support and approval of the management of higher education needs to be studied more back to get an adequate comparison. Web 2.0 techniques are very people centric activities and thus adaptation is very fast. People are coming much closer to another and all social and geographical boundaries are being reduced at lightning speed which is one of the biggest sustenance factors for any social network. Using Web 2.0 also increases the social collaboration to a very high degree and this in turn helps in achieving the goals for a social network[12,13,14].

In the light of above discussion it seems that in this age of information and technology Web 2.0 is playing an important role for providing/gathering information which help the users to complete their daily activities in the field of education, technology etc. Now a days it provides information faster than previous and helps students to make the study and research work easier.

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# Awareness of Information Needs and Use of Library Resources and Services among Student-Teachers: A Study

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## Abstract

As colleges of education train next generation teachers, B.Ed. students are expected to be the catalysts in developing the student community. Hence, cognizing their own information needs and vocalizing them will help them in playing their path showing role as teachers. With this intention, the study on assessment of awareness of information needs and use of library resources and services of student-teachers in Mumbai was conducted. Since awareness of library resources and services helps in fulfilling information needs by the users themselves, the first step in this study was finding out awareness of library resources and services. Further awareness of library services and use was tested through Pearson correlation coefficient. Total 353 sample of student-teachers and 11 librarians from 11 aided B.Ed. colleges of Mumbai was academic preparation. Regarding e-resources like e-journals and e-books there was not much awareness among student-teachers. In addition participants were not able to distinguish between search engines, websites and online databases. The present paper reports the study which explored and assessed the awareness regarding information needs, use of library resources and services among the B.Ed. students in the Education Colleges of Mumbai.

**Keywords**: Awareness of Library Resources; Information Environment; Information Needs; Information Literacy; Information System; Library Instruction.

### Introduction

Recognizing one's own information needs and converting them into demand is itself a difficult task. On the other hand eliciting information needs of users is the challenge faced by librarians in academic libraries. This paper is a part of user study, which is an effort to assess the awareness and use of library resources and information needs of B.Ed. College students in Mumbai. Since awareness of library resources and services helps in fulfilling information needs by the users themselves, the first step in this

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Received on 17.06.2017, Accepted on 28.06.2017

study was finding out awareness of library resources and services.

### Need of the Study

In the colleges of education which train next generation teachers, the task of identification of information needs is more crucial and essential for librarians as the future of prospective students is in the hands of student-teachers. The trainee teachers, referred as student-teachers are expected to be the catalysts in developing the student community. Hence, cognizing their own information needs and vocalizing them is also equally important as it will help in playing their path showing role as teachers. With this intention, the study on assessment of awareness of information needs and use of library resources, services of student-teachers was conducted. This would also help the Librarians of B.Ed. Colleges to set up their library system and services gearing towards the needs identified. Lack of research on the information needs of B.Ed. students in education colleges in general and particularly in

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Mumbai motivated the researchers to conduct this study.

## **Objectives and Hypothesis**

The chief objective of this study was to identify the information needs of B.Ed students in Mumbai and to find out the relationship between their awareness of library resources, services and use of library.The study further explored the need and focus of information literacy programmes for B.Ed students.

### The Objectives Formulated for this Study were

To determine the information needs of studentteachers in B.Ed. colleges and how far they arefulfilled.

To ascertain whether according to participants and librarians the library has adequate materials to fulfil information needs of participants.

To find out usage of library resources generated out of information needs.

To find out whether the student-teachers need guidance from the librarian to fulfil their information needs.

To find out awareness and use of library services among student-teachers.

To ascertain whether participants need any special instructions or training regarding library use

## Hypothesis

### The Hypothesis Generated out of the Objectives is

H0: There is no significant relationship between awareness of library services and use of library services by the student-teachers

### Scope and Limitations

The study included the student-teachers and librarians from 11 aided B.Ed. Colleges - 10 affiliated to the University of Mumbai and one affiliated to SNDT Women's University in Mumbai city and metropolitan regions of Mumbai.

Student-teachersof special education colleges, and those pursuing D.Ed., M.Ed., and M.A. in education from teacher training institutions were out of the scope of the study. The study did not take into consideration the statistics of usage of library materials. Instead it considered the use of different types of information resources as mentioned by the student-teachers. Usage of information resources was not drawn from the daily statistical data of the library.

## Literature Review

It is interesting to examine how the concept of information need evolved and was interpreted with time. Information need defined by Brenda Dervin, as a gap in a person's knowledge that, when experienced at the conscious level as a question, gives rise to a search for an answer [1]. The experience of user's information need could be viewed as proceeding through four basic cognitive levels; visceral need, i.e.the actual, but unexpressed need, conscious need, i.e. within brain description of the need, formalized need, i.e. the formal statement of the need and the compromised need - the question as presented to the information system [2]. If information needs can be considered a generic concept, then there are subsets which address information demand and information wants [3]. Information needs are 'a state of uncertainty recognized by an individual'. Krikelas believes in the idea of unconscious needs as irrelevant to active information seeking [4]. Search begins with a problem and a need to solve it, a person with some goals and intentions, finds that these goals cannot be attained because the person's resources or knowledge are somehow inadequate.A characteristic of such a 'problematic situation' is an anomalous state of knowledge (ASK) or information need [5]. There are many other factors such as work role, socio-culture and work environment, and nature of organization which trigger the information seeking [6]. Two phased comparative study of problem based learning (PBL) curriculum and traditional curriculum of medical students, shows that PBL students use a greater variety of sources more frequently than students taught with traditional methods. PBL studentslearn how to seek information at an early stage of education [7]. Information need is a complex phenomenon generated by complicated environments and peoples' minds [8]. The information needs of immigrant Sudanese youths are mainly academic in nature. They used informal sources of information like colleagues, friends, neighbours and relatives [9]. It is important that need is not mistaken for demand. The demand for information or documents may be low, for example, because the library is seen as inaccessible by the users. Still, the needs exist [10]. Many cognitive psychologists divide human needs into three basic categories i.e. physiological needs, affective needs, and cognitive needs. All these three categories of needs are interrelated. This means that as a part of the search for satisfaction of these needs, an individual may engage in information seeking [11] Information needs behaviour and information seeking behaviour are strongly interrelated with each other.[12]Further students are interested in good grades and they attempt to figure out what their instructors want in a research paper and just give attention to the number of pages and type of sources[13]. Information needs involve a cognitive process, which may operate at different levels of consciousness. According to Prajapati, information needs are what an individual ought to have for his work and require research, education and psychological bent of mind towards selfdevelopment [14]. Literature on information needs and information seeking is rising since 1991. Information needs articles mainly concentrated on the discipline of medical sciences, while most information seeking articles came from the discipline of LIS [15].

The literature reviewed clearly indicated the gap and showed that the study of information needs of B.Ed. students in Mumbai, tracing their awareness about information needs, library services and resources had not been conducted.

## Materials and Method

The study adopted descriptive research design and survey method. In order to collect the primary data sample of 50 B.Ed. students per college wasselected whichtotalled to 550. Out of 550, filled 353 questionnaires were returned. The Sample was selected by simple random sampling technique by using lottery method. Further data was collected from librarians of 11 education colleges of Mumbai city as well. Collected data were analysed by using simple statistical method with the help of Microsoft Excel. Relationship between awareness and use of library serviceswas computed through Pearson correlation coefficient test.

### **Results and Discussion**

In order to determine the information needs of participants and how far their information needs get fulfilled by the library, it was necessary to explore and analyse the factors like adequacy and usage of different types of information sources, formal training regarding library use, and the difficulties faced by librarians while fulfilling information needs of student-teachers. Hence, the awareness of resources and services and its relationship with theurge for library usage was tested qualitatively and quantitatively.

### Awareness of Library Resources

Awareness of library resources and services is an important prerequisite for effective and optimum utilization of library resources. Role of teachers, librarians as catalysts in this awareness of library resources and services is undebatable. Hence, whether they played any crucial role in making the student-teachers aware was examined. Next,the opinions of participants on suitability of library timings and infrastructure also were sought.

In this context according to 51% respondents teachers made them aware about the library services. 33% opted for librarian as an option and 11% mentioned that they on their own became aware about library services by going to the library. 5% became aware through friends (Table1). Findings revealed that teachers played the prominent role in making participants aware about library services and resources.

### Satisfaction - Library Timings

82% of respondents mentioned that library timings were not the hurdle in the process of fulfilment of information needs. The following pie chart explains the situation.



## Satisfaction -Library Infrastructure

85% participants were satisfied with the library infrastructure (Figure 2). It shows that B.Ed. college library infrastructure was facilitating information seeking of student-teachers.

### Satisfaction of Library Infrastructure



### Information Needs Analysis

Information needs analysis brought forth the following results.

## Adequacy of Library Resources

The prime objective of academic libraries is to support teaching-learning process and research. Therefore library resources should be sufficient in quality, depth, diversity and currency to support and to meet the information needs of the student-teachers. Hence adequacy of library resources was studied through the opinions of librarians and studentteachers.

## **Opinions of Librarians and Student-Teachers**

Adequacy of different types of library resources was as follows (note: extremely inadequate and completely adequate resources only taken into consideration for statistical purpose) : Maximum (91%) librarians and 43% student-teachers indicated textbooks as completely adequate, 45% librarians mentioned that previous projects, and theses/dissertations as completely adequate, whereas 20% and 8% studentteachers reported complete adequacy for the same. According to 28% librarians and 26% and 21% participants' encyclopaedias and dictionaries were completely adequaterespectively.

Further CD-ROM databases, conference proceedings, e-books and e-journals reported as inadequate by the 28% Librarians, whereas 16% participants indicated e-books as completely adequate. Beside this according to 13% participants' ejournals, 18% CD-ROM database and 11% conference proceedingswere inadequate (Table 2).

It was evident from the findings that various types of e-resources like e-journals, CD-ROM.

Databases and e-database were insufficient to fulfil the information needs of the participants.

It was also observed that there wasdifference in perception of librarians and student-teachers as far as adequacy of library resources is concerned. It is obvious that the opinions of the librarians should be taken as valid here as they know their own collection well. The reason could be perhaps the participants report the adequacy of the library material according to use and fulfilment of their information needs. This indicated that according to the participants' collection of textbooks were adequate to meet their academic information needs, whereas eresources such as e-books, e-journals were inadequate. In spite of majority of the B.Ed. Collegelibraries subscribing N-List database and separate orientationsession conducted, findings indicate that student-teacherswere not aware or they were not using various e-resources. Therefore there is a need to organise comprehensive e-information literacy programme for the participants. In addition there is a need to make them understand about the importance and use of e-resources in the fulfilment of information needs. According to the some college librarians where the venue of project work was compulsorily library, the awareness and use of N- List was noteworthy.

## Usage of Information Resources

Further, in order to determine information needs of the student-teachers it was crucial to figure out the use of information resources. As mentioned earlier usage of information resources does not take into consideration the daily usage statistics of the library. It is the extent of usage of library materials mentioned by the student-teachers.

# Librarians' Opinions

Librarians were asked to indicate weightage of usage of information sources by student-teachers. All the librarians mentioned that textbooks and question papers were used very heavily. According to 82% librarians reference books (e.g. encyclopedias, dictionaries) were highly used. 73% mentioned that research projects, magazines and newspapers were highly used whereas conference/seminar proceedings were in low use. 55% librarians revealed that journal articles were highly used and library catalogues and indexes were very low used, further 45% librarians indicated that theses & dissertations were highly used, 64% mentioned that use of bibliographies was very low amongst studentteachers (Table 3).

## Usage by Student-Teachers

It was found that 71% participantsopined they used textbooks, 62% used reference books such as encyclopaedias, dictionaries.61% used question papers and 41% used newspaper to fulfil information needs. 37% used research projects, 29% used magazines and 25% participants' used journal articles. 14% participants' used bibliographies. Very low usage of conference/seminar proceedings (12%), library catalogue (11%), indexes (9%) and theses and dissertations (8%) was indicated to meet information needs (Table 3).

Findings show that majority of participantsused the library material which were adequate to meet their academic information needs e.g. textbooks and reference books. It is alarming to note that other research oriented information sources such as conference proceedings or theses and dissertations were used by less percentage of participants'. This indicated that student- teachers gave importance to examination oriented activities.

It is pertinent to note that the participantswere not using information tools like bibliographies, indexes. They were not even reading journal articles and project reports perhaps because of non-awareness of their significance in studies.

Catalogue use is the first thread of starting the search in the library. However, the usage of the catalogue was very low. Perhaps participants did not have adequate skills or training for catalogue use. Findings revealed that at proper juncturethere is a need of exhaustive library awareness program which will induce optimum utilization of other library resources. There is a need to further assess the reasons for low usage of other information sources like journal articles, indexes and bibliographies by participants'. The course of B.Ed. should be devised and revised in such a manner as it will require the use of these resources for their course work.

## Usage of E-Resources

Use of different types of e-resources was investigated through opinions of student-teachers and librarians.

## Student-Teachers'Opinions

It was interesting to note that 55% participants used different websites as chief information sources. Online databases were used by 49%, e-books were used by 35% (from N-list), e-journals were used by 21% and CD-ROMS were used by 11% of respondents. As observed from the Figure 3, more than half percentage of participants was using websites for getting information. This indicates that participants were more aware about the different websites as compared to e-books and e-journals.

Findings of this section established that different websites are popular among the participants as compared to e-books, online databases and e-journals. However, considering the impact of information technology in the present era the usage figures given by respondents was not satisfactory.

## Librarians' Opinions

According to 73% and 45% librarians, websites and CD-ROM databases were highly used respectively. 36% librarians indicated that e-books and e-journals were used and only 18% mentioned usage of online databases by participants (Table 4). When analysed qualitatively following findings emerged.

# E-Journals

The respondentswere asked to note the names of eresources used. However they failed to give the names of e-journals. 4% used but they do not remember the name, 3% used e-journals through databases like Nlist, JSTOR, PUBMED, Indian institute of education website, 3% used Wikipedia and YouTube for reference work. It was found that the respondentswere unaware about the names of e-journals.

## **Online** Databases

Participants were asked to name a few online databases used. 9% answered they used Google, and 8% answered they used Wikipedia as they got lots of information regarding project work. 12% used databases and websites for instance NCBI (The National Center for Biotechnology Information) and PUBMED database, Indian institutes of education. Other web sources mentioned as used by them were-Moodle, N-list, Eric, Springer, Science direct, Book Rags, ask.com, scarlert.com, www.enotes.com, mathisfun, Metacrawler, Poetry foundation etc. They found these sources easy, convenient and reliable. In addition, online encyclopaedias, dictionaries, Slide share and YouTube, PowerPoint presentations were used by 2% participants. 7% did not remember the name because they focused on the content of the source, whereas 1% did not refer online databases. Remainingparticipantsdid not answerthis question. This indicates that participants can not differentiate various modes of e-resources i.e. online databases, search engines, websites and software.

## Reasons for Non-use

Following reasons were given by participants for the non-use of online- resources

- 1. They never felt the need to refer to e-journals and online-databases.
- 2. They preferred to use print materials from the library
- 3. They were not aware of use of online resources
- 4. Their college library does not subscribe to online resources
- 5. Time constraints was the hurdle in using ejournals
- 6. They were not comfortable with the online databases

7. They do not have computer and internet facility at home

These findings emerged in spite of majority of the B.Ed. College libraries subscribing to E-Journals/ NLIST and all the colleges giving access to internet. Access to computer and internet facility was one of the hurdles, which revealed that college libraries need to be equipped with proper internet services to the student-teachers. It was also found that the participants could not distinguished between search engines, online databases and other information resources such as online encyclopaedias.Detailed information literacy programmes by B.Ed College Librarians focusing the distinction between types of e-resources, their use and access will generate awareness and motivation regarding the use of eresources.

## Use of Informal Information Sources

Participants utilized more informal information sources in the process of satisfying academic as well as other information needs. 76% participants consulted the experts in the field, 68% indicated the teachers as source of information and very less percentage i.e., 11% of participants mentioned classmates to satisfy their information needs (Table 5). It is very positive indication that participants consulted experts in the field during the information search process. Findings indicated that the participants were aware of the right informal source of information.

#### Guidance in Information Seeking

Following discussion explores librarians' initiatives for making participants information literate, and elaborates impact and importance of user education programmes for student-teachers.

#### Library Instructions

All 11 B.Ed. college librarians indicated that various user education programmes have been offered to the participants. Along with this, training sessions to search information in the e-resources and on the internet were organised by all the libraries, in order to make information seeking more fruitful.

#### Information Literacy Programmes

Participants were asked to indicate whether their college library conducted various user education programmes (Table 6), in this context 56% participants

mentioned library orientation, 44% of them indicated lectures on library use, 36% mentioned PPT presentation for the library use and 28% indicated library tour and training for internet search. Training for e-resources search mentioned by 23% of them and 24% indicated that college library does not conduct any library user education programmes. Findings indicated that all the libraries conducted user education programmes. Yet the findings of the usage and adequacy of library resources showed that student-teachers were not much aware about library resources. This may be because of participants not considering user education programmes useful. Therefore, there is a need to motivate participantsto attend such type of training in order to make them self-dependent and to do successful information search in the library. There was also a need to make participantsa ware of importance of attending these programmes. In addition on the librarian's part they need to assess productivity of user education programmes.

## Impact of Information Literacy Programmes- Librarians' Perspective

Regarding the impact of information literacy programmes following results emerge, (Figure 3). 64% librarians agreed on, after giving introductory training participantsbecame more confident of searching information on the internet and comfortable in using library catalogue, 55% librarians agreed that participantsbecame more comfortable and confident of searching information in the library. 45% strongly agreed on an availability of digital library /online library would have had the great impact on information seeking of participants. Findings indicate that information literacy programmes were the core of successful information seeking of participants. However findings of the usage of information sources sections indicated that majority of participants used library material to satisfy academic information needs. This means there was lapse in the conduct of information literacy programmes. Either they were not conducted at proper juncture or not repeatedly conducted emphasising the importance of information sources. Giving the students practical sessions and involving them in information search exercises with feedback form during the user education programmes may work better towards fulfilment of their information needs. The following figure indicates the impact of information literacy programmes as given by the librarians. It was also found that no B.Ed. college library sought feedback of information literacy programmes focussing different aspects of user education.

#### Impact of Information Literacy Programme



SA = strongly Agree, A = Agree, DA = Disagree

## Importance of User Education Programmes – Participants Perspective

Fig. 3:

Library user education programmes are intended to create awareness about library services and resources amongst the student-teachers. While assessing the importance of such programmes, according to 58% participants' user education programmes were very important whereas 42% mentioned that it was not so important. Findings revealed that more than half percentage of participantsregarded user education programs asimportant in the education colleges to satisfy information needs. Considering remaining participants they might not be aware of the importance of user education programmes. Therefore it is the chief responsibility of library professionals to intensify their efforts to educate participantsand motivate them to attain library training.

#### Correlation of Awareness and Use of Library Services

Participants were given list of services offered by the library and asked to indicate whether they were aware of the library services and their significance, to fulfil information needs. In order to find out whether there was arelationship between awareness and use of library services by the B.Ed. students, Pearson correlation coefficient was computed. Descriptive statistics showing the relationship between awareness and use of library services is given in Table 7.Subsequently following null hypothesis was tested.

*H0:* There is no significant relationship between awareness and use of library services by student-teachers.

The Table 7 indicates that p value was less than .00001 which means it is significant at .05 levels, therefore it can be inferred that there was a significant

relationship between awareness and use of library services by the student-teachers. Hence, the null hypothesis was rejected and the following alternative hypothesis was generated.

H1: There is a significant relationship between the awareness of library services and library use by student-teachers.

Findings indicated that awareness of library services motivate participants to use those services more. However, considering the usage of library resources extensive efforts need to be taken by the librarians and teachers to create awareness amongst the student-teachersabout the library resources. This will certainly have a positive impact on information seeking of participants.

## Information Needs Fulfilment-Difficulties Faced

Librarians were asked to rank the difficulties they faced while fulfilling information needs of the participants, 82% librarians ranked budget constraints- first, 64% ranked non-availability of human resource - second, 55% ranked inadequate library resources - third, 36% librarians ranked college time table- fourth, 28% ranked cooperation from the teachers- fifth and 18% ranked support from management - sixth (Table 8).

Findings revealed that library budget was the major difficulty in fulfilling information needs of B.Ed. student. Inadequacy of library resources may be the consequence of this. In this scenario policy makers should think of increasing the library budget to satisfy information needs of student-teachers.Qualitative data revealed that solo librarianship with one library peon and inadequacies of books were the difficulties mentioned by 18% librarians. 
 Table 1: Awareness of Library Resources

Source	Freq.	%
Teachers	181	51
Librarian	116	33
Self	40	11
Friends	16	5
Total	353	100

## Table 2: Adequacy of Library Resources

Name of the Source	Libra	arian%	Student-teachers%		
	1	2	1	2	
Textbooks	91	0	43	3	
Previous Projects	45	0	20	6	
Theses/Dissertations	45	0	8	11	
Dictionaries	28	0	26	5	
Encyclopaedias	28	18	21	6	
e-journals	18	28	8	13	
e-books	9	28	16	10	
CD- ROM Databases	0	28	5	18	
Conferences/ Seminars Proceedings	0	28	9	11	

Note: 1= Completely Adequate 100%, 2 = Inadequate Below 25%

## Table 3: Usage of Information Resources

Information Resources	Librarian %	Student-teachers %
Textbooks	100	71
Question papers	100	61
Reference Books (e.g. Encyclopaedia, Dictionary)	82	62
Magazines	73	29
Newspapers	73	41
Research Projects	73	37
Journal Articles	55	25
Theses & Dissertations	45	8
Library Catalogues	36	11
Indexes (e.g. Index to education	18	9
Bibliographies	0	14
Conferences/Seminars Proceedings	0	12

Table 4: Use of E-information Sources

Electronic Information Sources	Participants		Libra	Librarians	
	Freq.	%	Freq.	%	
Websites	194	55	8	73	
Online databases	172	49	2	18	
e-books	124	35	4	36	
e-journals	73	21	4	36	
CD-ROM Databases	38	11	5	45	

Table 5: Informal Information Sources

Sources	Erog	0/_
	Heq.	/0
Consultation with experts	268	76
Discussion with teachers	241	68
Discussion with classmates	38	11
Table 6: Information Literacy Programmes		
Library Education programmes	Freq.	%
Library orientation	199	56
Lecture on library use	156	44
PPT Presentation for library use	127	36
Library Tour	99	28
Training for Internet Search	99	28
Training for e-resources search	80	23
None of these	83	24

Ν	r – value	Df	Test statistic	p -value	Level of Significance
353	0.985076	351	18.98156	.00001	Significant
Table	8: Difficulties Faced	by Librarians			
	Difficulties		Frequency	%	Rank
L	ibrary budget constra	aints	9	82	1
Ava	ilability of human res	sources	7	64	2
In	adequate library reso	urces	6	55	3
	College timetable		4	36	4
С	o-operation from tead	chers	3	28	5
St	upport from manager	nent	2	18	6

#### Table 7: Correlation of Awareness of Library Services and Library Use

#### Suggestions

Following suggestions emerge from the study:

### For Librarians

- Various types of information literacy programmes should be organised at frequent intervals in order to educate student-teachers about how to use library resources and facilitate easy information seeking in the library.
- Student-teachers were not aware of the distinction between the different formats of online resources. Rigorous information literacy programmes should be conducted stressing the use of Google, e-journals and online databases.
- Relevant and latest editions textbooks, reference books and other library material should be added in the library.
- Student- teachers should be motivated to attend information literacy programmes.
- Feedback on information literacy programmes should be collected and analysed for further improvement in the situation.

### For Teachers

- Teachers should use library resources and involve the student-teachers in project-based activities useful for studies. Such activities should be based on library and online resources.
- Teachers should motivate student-teachers to visit and use the library.
- Student-teachers should be motivated to use other library resources apart from the study related resources.
- More awareness should be created among participants regarding library resources and services which would have the positive impact

on information seeking of participants.

### For Policy Makers

- Library budget should be increased to provide relevant and latest editions textbooks reference books and other library materials.
- Library should be given priority and adequate computers for internet service should be provided
- B.Ed. course design should take into account the library work by the participants.

### For Student-Teachers

- Student-Teachers Should put demand for frequent information literacy programmes.
- Should asked more time for library reading.
- Should give constructive suggestions for improvement of library system.

## Conclusion

Realization of information need is the cognitive process; it operates at the cognizant level of the persons. The first stage of satisfaction of information needs is one's own recognition that s/he is in the need of information. It was found that the most predominant information need of the participants was academic preparation. Regarding e-resources like e-journals and e-books there was not much awareness among student-teachers. In addition participants were not able to distinguish between search engines, websites and online databases. However, B.Ed. college libraries conduct information literacy programmes but the purpose is not served appropriately. It is very much needed to train studentteachers to recognize, search, receive and evaluate the information resources to satisfy their information needs.

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# Research Contributions of KUK and MDU: A Bibliometric Study

## Sanjay Kumar Kaushik

## Abstract

Education plays a vital role in every individual's life. The responsibility of imparting education lies on the shoulders of educational institutions. The role of various educational institutions differ according to the level of education they impart. Universities in India have been assigned the responsibility of higher education. In addition to teaching, universities also carry out research. The results of these are published in the form of research contributions. The present study is aimed to analyse the research contributions of KUK and MDU from the bibliometric point of view. It is found that 4255 research contributions have been contributed during the last ten years by these two universities. The degree of collaboration is 0.95. Foreign research collaboration has also been noticed. More than seventy five percent of the contributions are in the form of research articles.

Keywords: Bibliometrics; Research Contributions; Scientometrics.

## Introduction

"The destiny of India is now beingshaped in her classrooms. This, we believe, is no mere rhetoric. In a world based on science and technology, it is education that determines the level of prosperity, welfare and security of the people. On the quality and number of persons coming out of our schools and colleges will dependour success in the great enterprise of national reconstruction whose principal objectiveis to raise the standard of living of our people" [1]. Education system of a country is primarily responsible for the growth and development of its citizens. University Grants Commission is responsible for the promotion and co-ordination of University education and for the determination and maintenance of standards of teaching, examination and research in Universities. The teaching faculty in the university are not limited to the classroom teaching but they are actively

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Received on 02.05.2017, Accepted on 16.05.2017

engaged in research work. The number of contributions from the faculty of a university is one of the core indicators for the quality assessment of a university.

The foundation stone of Kurukshetra University was laid by Dr. Rajendra Prasad, the first President of India, on 11th January 1957. The University which started with a focus on Sanskrit and Indic Studies took a big leapforward in 1961 by transforming its initial unitary character into a multi-faculty university. Presently, the University comprises of 10 faculties on thecampus with 47 departments and institutes. Since its inception the University haspursued excellence in teaching and research. Today, it is widely acknowledged as a premier institution in key areas of higher education like science & technology, humanities, social sciences, commerce and management, law, Indological studies, education, fine arts and sports. With a highly qualified and motivated teaching faculty, KurukshetraUniversity offers students from throughout the country a worldclasseducation by providing learning experience. The university has more than four hundred faculty members to achieve its goal of quality education [2].

Maharshi Dayanand University (MDU), *ab initio* established as Rohtak University, Rohtak, came into existence by an Act No. 25 of 1975 of the Haryana Legislative Assembly in 1976 with the objective to

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promote inter-disciplinary higher education and research in the fields of environmental, ecological and life sciences. It was rechristened as Maharshi Dayanand University in 1977 after the name of a great visionary and social reformer, Maharshi Dayanand. The University campus, spread over an area of over 665.44 acres, is well laid with state-ofthe-art buildings and magnificent road network, and presents a spectacle of harmony in architecture and natural beauty. Educational and research programmes are offered through its 36 departments [3].

## **Objectives**

The aim of the present study is to identify and compare the various bibliometric aspects of the scientific contributions of the researchers and faculty of Kurukshetra University, Kurukshetra and M D University Rohtak. The specific objectives can be mentioned as under:

- To know the authorship pattern.
- To identify the proportion of single versus multi authored contributions.
- To compare the degree of collaboration.
- To analyse the trend in the average number of authors per paper.
- To analyse the year-wise growth pattern of contributions.
- To know the most preferred journals.

## Methodology

The study is conducted by attempting an advanced search on Scopus database. The search is restricted to Kurukshetra University, Kurukshetra and Maharshi Dayanand University, Rohtak and time period from 2007 to 2016. After importing the data, it was codified. To get results in tabular form SPSS has also been used. The analysis facility of Scopus has also been utilized.

## Results

The analysis of the results is being presented in tabular form along with description of the same under different sub-headings:

#### Year Wise Distribution

The total number of contributions made by KUK faculty is 2484 and MDU faculty is 1771. The contributions of KUK faculty are 40.26% more than those of MDU faculty during these ten years. The maximum number of contributions by KUK faculty were 332 (2011 & 2012 both) and the maximum number of contributions by MDU faculty were 293 (2016). During the last five years MDU faculty has contributed about 70% of its total contributions whereas KUK faculty has contributed about 57% of its total contributions during the last five years. The growth trend of MDU is seen little sharper than that of KUK.

Year	KUK	MDU
2016	258	293
2015	274	216
2014	264	246
2013	297	258
2012	332	226
2011	332	168
2010	238	119
2009	200	71
2008	154	97
2007	135	77

#### Table 1: Showing year-wise contributions

### Authorship Pattern

The authorship characteristic of the contributions reveals that the pattern of single authorship is not predominant as mere 219 contributions out of 4255 are single authored which is almost double of that of CCSHAU, Hisar contributions [4]. The majority of contributions (53.68%) are either double authored or triple authored. As many as twenty one contributions were contributed by involving ten and more authors. The average number of authors per contribution is 3.27. There is no significant difference between average number of authors per contribution on the basis of university. The highest number of authors in a single contribution were thirty nine for KUK and twenty three for MDU.

#### Degree of Collaboration

To measure the collaboration in research formula

designed by K Subramanyam [5] is used. The formula is:

## C = NM/(NM+NS)

Where C is the degree of collaboration, NM is number of multi-authored contributions and NS is number of single-authored contributions. In other words it is the ratio of the number of multi-authored contributions to total contributions.

The degree of collaboration in the contributions under study is found to be 0.95 which support the results of Raja Ramanna Centre for Advanced Technology contributions [6]. The faculty of both the universities also have foreign collaborations with more than fifty countries. The top ten foreign collaborative countries have been listed in the below table along with the number of contributions. Both universities has the most foreign collaboration with United States. The second foreign collaborative country for KUK is Denmark whereas for MDU it is South Korea.

	KUK	MDU	Total
	KUK	Wibe	Total
Single	142	77	219
Double	756	466	1122
Triple	699	463	1162
Four	369	389	758
Five	279	211	490
Six	146	90	236
Seven	45	40	85
Eight	33	20	53
Nine	9	0	9
Ten and More	6	15	21
Total	2484	1771	4255

Table 2: Showing year-wise contributions

Table 3: Showing Country-wise co	ollaboration
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KUK	No. of Contributions	COUNTRY/TERRITORY	MDU
United States	37	United States	55
Denmark	28	South Korea	41
Saudi Arabia	27	Spain	33
Egypt	23	Saudi Arabia	29
Malaysia	20	Portugal	25
Czech Republic	14	Malaysia	16
South Korea	14	Belgium	13
Italy	13	Japan	10
Germany	11	Bangladesh	9
Greece	11	Israel	8

#### Subject-wise Distributions of Contributions

The major area of research contributions by KUK is Chemistry and Engineering whereas for MDU the major subject area of research contributions is Biochemistry, Genetics and Molecular Biology, and Pharmacology, Toxicology and Pharmaceutics in addition to Chemistry. A perusal of table 4 provides a picture of top ten subjects of contributions made by the faculty of both the universities.

Table 4:	Showing	Subject-wise	contributions
----------	---------	--------------	---------------

MDU	KUK
436	327
386	504
377	333
253	547
249	262
222	186
198	608
159	416
144	154
141	197
	MDU 436 386 377 253 249 222 198 159 144 141

#### Document type wise distribution of contributions

An analysis of type of document of contributions indicates that 78.87% contributions were published in the form of research articles and 10.38% in the form of conference papers. Rest of the contributions were reviews, book chapters, editorial, letter, and short survey etc.

#### Preferred Journals

The contributions of both the universities were published in various journals. To observe the preferred or popular journal, the list of source titles was analysed. There is no single journal which has attracted more than even four percent of total contributions. However, KUK faculty has the highest number of publications (81) inAIP Conference Proceedings followed by Medical Chemistry Research and further followed by Journal of Molecular Liquids. The MDU faculty has the highest number of contributions in International Journal of Pharmacy and Pharmaceutical Sciences (34) followed by Medicinal Chemistry Research (30) and further followed by AIP Conference Proceedings (24). Table 6 lists the top ten source publications of both universities.

Table 5: Showing Document type-wise contributions

Document Type	KUK	MDU
Article	1997	1359
Conference Paper	296	140
Review	85	138
Book Chapter	44	69
Article in Press	29	25
Erratum	9	3
Book	7	13
Editorial	6	14
Letter	5	5
Note	5	3
Short Survey	1	2

**Table 6:** Showing Top Ten Source publication of contributions

Source Title (MDU)	No. of Contributions	SOURCE TITLE (KUK)	No. of contributions
International Journal Of Pharmacy And Pharmaceutical Sciences	34	AIP Conference Proceedings	81
Medicinal Chemistry Research	30	Medicinal Chemistry Research	36
AIP Conference Proceedings	24	Journal Of Molecular Liquids	33
Der Pharma Chemica	19	Annals Of Biology	32
Research Journal Of Pharmaceutical Biological And Chemical Sciences	19	European Journal Of Medicinal Chemistry	27
Arabian Journal Of Chemistry	17	International Journal Of Pharmacy And Pharmaceutical Sciences	23
Indian Journal Of Heterocyclic Chemistry	17	Multidiscipline Modeling In Materials And Structures	22
International Journal Of Pure And Applied Mathematics	17	Journal Of Chemical And Engineering Data	21
International Journal Of Biological Macromolecules	16	Journal Of Chemical Thermodynamics	21
Journal Of Solution Chemistry	16	Journal Of Solid Mechanics	21

### Top Performers

While analysing the individual contributions, it is found that in Kurukshetra University, Kurukshetra, R. Kumar is the top performer with 227 contributions. Other significant contributors of KUK are D. Kumar (120), A. Pal (76), O. Parkash (72), C. Sharma (63), P. K. Sharma (61), K. R. Aneja (59), S. Kumar (53), N. Singh (53) and J. Sharma (51). In MDU C. S. Pundir is the top performer with 140 contributions. The other significant contributors of MDU are B. Narsimhan (90), S. P.Khatkar (60), S. S. Gill (59), V. K. Sharma (58), P. Shukla (50), V. B. Taxak (49), R. Parkash (46) N. Chauhan (45) and H. Dureja (45).

#### Conclusions

#### It was expected that due to the requirement of APIs

for direct recruitment and promotions under Career Advancement Scheme in the colleges and universities, the single authorship pattern will rise as single authored contribution fetches more points. But contrary to this, the results clearly reflects that still the trend of multi-authorship prevails. Arora and Pawan [7] emphasized that increase in multi authorship and collaboration between researchers is an indication of growing professionalism in different fields. Hence it can be viewed that team research is predominant over solo research. As more than 75% of the contributions are in the form of Research articles, this highlights the academic and research interest of the faculty of both universities.

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# Use of Social Networking Sites Facebook, Google Plus, Linked in, and Twitter among user of State Library, Odisha: An Exploratory Study

Lambodara Parabhoi\*, Pramod Kumar Meher\*\*, Ramani Ranjan Sahu\*\*\*

## Abstract

Now day's Social networking sites are very popular among the youth. The paper highlights how and what extend the user of State Library Odisha are use social networking sites (Facebook, Twitter, LinkedIn, and Google+). There are 83 no of response received from the user. It has found that Facebook (95.2%) is most popular social networking site among user of state library Odisha. The user of State library Odisha spent hours in Social networking sites. It is also found that, the users are well aware about Social Networking Sites. The users of the State library Odisha useSocial Networking Sites via Mobile 69(83.1%) rather than other devices like Laptop, Tablet, desktop etc.

Keywords: Social Networking Sites; Facebook; Twitter; LinkedIn; and Google Plus; State Library; Odisha.

## Introduction

Social networking sites (SNS) play a very vital role in social life of every person. Social networking sites are rapidly grown and it is gaining popularity among the young people particularly.

Now a day's people are updated their thoughts, ideas using various kinds of social networking sites like Facebook, Twitters, LinkedIn, and Google+ and LinkedIn. Facebook one of the biggest social networking sites which have now became the one of the popular social networking sites among other social networking sites. It was introduced in the year 2004.Twitter was introduced in the year 2006 its one popular micro blogging site.LinkedIn is a professional social networking site where people create his her profile add professional work experience, academic activities etc. It was come into existence in the year 2002.Google+ introduced in the year 2011.

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Received on 22.06.2017, Accepted on 28.06.2017

## HK Mahtab State Library

Hare Krushna Mahtab State Library is one of the best Public library in Odisha. It was established in the year 1959 during 1st Five Year Plan at state capital Bhubaneswar in the year 1967 it was name as Gandhi Bhawan. Again it was rename, the State Library and the Public Library as Harekrushna Mahtab State Library in the year 1987in the memory of Dr. Hare Krushna Mahtab, the builder of modern Odisha. Collection: The library has good collection of books and resources, it includes books(1, 44,000), Magazines(56), Newspapers (15). According state library website there are 6000 no of registered members.

## **Objectives of Study**

To identify what extent the social networking sites are used by user of State.

### Library Odisha

- To ascertain how they use social networking sites.
- To discover the how much time spent in social networking sites.
- To identify which social networking sites are use.
- To discover why they use SNS in day today life.

• To find out mostly use social networking site

### Literature Review

A study conducted by (Omekwu, Eke, & Odoh, 2014) on social networking sites use of among the undergraduate students of university of Nigeria Nsukka.The study found that, most of the students are using SNSS. The sample size was 150 undergraduate students. The students of were spending their time for connecting to their classmates for online study interaction with friends, watching movies and discussing serious national issues etc.

(Iorliam & Ode, 2014) investigate the impact of Social Network Usage on University Students Academic Performance using Benue State University Makurdi, Nigeria. The main area of study ware how spent time on social media, and the relationship between the volume of social friends and a student's academic performance and the frequency of visiting social media

(Iordache, Drago<sup>o</sup> Daniel; Lamanauskas, 2013) conducted a study in Romanian University Students. The finding of the study shows that, Most of students spend their time of social networking websites YouTube, Facebook, Google+, LinkedIn, Facebook, Twitter, Hi5 etc. Furthermore reported that, YouTube and Facebook are more popular among the students. (Sahu, 2013) study information dissemination on social networking sites by library professional of engineering colleges of Odisha.

A Study has mad by (Hamat, Embi, Pendidikan, Hassan, & Pendidikan, 2012) on use of Social networking sites (SNSs)among the students of Malaysian University. And discovered that, SNSs has popular among the youths and spending more time on SNS for socializing rather than learning.

#### Methodology

The Present study based on random sampling method. The 150 Questionnaire has been distributed to the user only received 83 questionnaire. The data collected on February, 2017. And analyzed using Ms-Excel sheet and SPSS software.

#### Data Analysis of SNS

#### • Gender wise Distribution of Respondents

The data collected from 83 researchers, 21 Under Graduate respondent, 34 Graduate respondent, 27 Post graduate and 1 MPhil respondents have been

Gender	Male	Female
Female	19	23.00 %
Male	64	77.00 %
Total	83	100.00 %
<b>Fable 2:</b> Status wise distribut	ion	
Status	Respondents	Percentage
Under Graduate	21	25.3 %
Graduate	34	41 %
Post Graduate	27	32.5 %
MPhil	1	1.2 %
Total	83	100
Table 3: Age Wise distribution	n	
Age	Respondents	Percentage
15-20	27	32.5 %
21-25	40	48.2 %
26-30	15	18.1 %
31-40	1	1.2 %
Total	83	100

analyzed. Table 1 shows that out of 83 respondents, 64 (77%) were male and 19 (23%) of respondents were female.

Status wise distribution of respondents

The Table 2 well-found directly above provides a brief account of the basic information of the

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#### Table 1: Gender wise distribution



Fig. 1: Age Wise distribution

respondents covered under the study. Here it is seen that out of 83 respondents 25.3% are UG students, 41 % are Graduate Students and remaining 32.5 % and 1.2 % are PG & MPhil students.

Age Wise Distribution

Table 3 presents the age wise distribution of respondents. The data shows that majority of the 40 (48.2%) of respondents fall between the age group of 21-25, 27 respondents (32.5%) fall between the age

Table 4: Social networking accounts of users

group of 15-20, 15 respondents (18.1%) of fall between the age group of 26-30 and 1 respondent (1.2%) of is the age group of 31-40, who used social networking sites.

• Social Networking Accounts of users (Facebook, Twitter, LinkedIn, Google plus)

This table 4, data shows that 100 % users have using social networking accounts that having Facebook, Twitter, LinkedIn & Google Plus.

Social Networking Accounts	Respondents	Percentag	
83	83	100 %	
Table 5: Frequency of Using Soc	ial Networking Sites		
Frequency	Respondents	Percentage	
Daily	15	18.07 %	
Weekly	68	81.93 %	
Total	83	100	



Frequency of Using Social Networking Sites

To ascertain how frequently use social networking sites by the respondents for these only two options has given (1) daily and (2) Weekly to the respondents. Form the collected data it is indicated that 68 (81.93%) of the users visit the SNSs weekly and only 15 (18.07%) users visit the SNSs daily.

# Fig. 2: Frequency of Using Social Networking Sites

#### Time Spent on Social Networking Sites

The Table 6 shows that out of 83 respondents, 54



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Frequency	Male	Female	<b>Total Respondents</b>	Percentage
1-2 hours	44	10	54	65.06 %
3-10 hours	11	6	17	20.49 %
11-20 hours	9	3	12	14.45 %
Total	64	19	83	100

Table 6: Time Spent on Social Networking Sites

(65.06%) users havespenttheir time 1-2hours in using social networking sites, 17 (20.49%) of them spend 3-10 hours, 12 (14.45%) of them spend 11-20 hours in using social networking sites.

(84.1%) use social networking site through Mobile, 43 (52.4%) use these sites by Laptop, 16 (19.5%) use these sites by Desktop and 1(1.2%) user use the table for using SNS sites.

• Platform of using Social Networking Sites

The Table 7 shows that majority of the users 69 The T

The Table 8 shows that majority of the users 82

Friends in Social Networking Sites

	Table 7: Platform	of using Social	Networking Sites	
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Platform	Respondents	Percentage
Mobile	69	84.1%
Laptop	43	52.4%
Desktop	16	19.5%
Tablet	1	1.2%

Table 8: Friends in Social Networking Sites

Friends	Respondents	Percentage
Friends	82	98.8%
Professor	37	44.6%
Friends of Friends	40	48.2%
People you never meet	20	24.1%

(98.8%) use SNSs to connects or to find theirs friends, 37 (44.6%) users use to connects with professors, 40 (48.2%) use to search friends of friends and 20 (24.1%) use these sites to people you never meet and connect with them only SNS sites.

• Problems in using Social Networking Sites

The Table 9 describes the various problem faced by the respondents in using SNSs. The majority of the respondents 53 (63.9%) expressed Lack of time, 19

Table 9: Problems in using Social Networking Sites

(22.9%) respondents feel that Lack of technical knowledge, 43 (51.8%) respondents expressed that Low speed of internet while using SNSs and only 3(3.6%) respondents said that SNSs are Not user friendly.

## • Purpose of using Social Networking Sites

The Table 10 shows that majority of the respondents i.e. 67 (80.7%) use social networking sites for Entertainment, 58 (69.9%) use these sites for

Problems	Respondents	Percentage
Lack of time	53	63.9%
Lack of technical knowledge	19	22.9%
Low speed of internet	43	51.8%
Not user friendly	3	3.6%

Table 10: Purpose of using Social Networking Sites

Purpose of using	Respondents	Percentage
Entertainment	67	80.7%
Education	58	69.9%
To meet new people	35	42.2%
Instant message	45	54.2%

Education, 35 (42.2%) respondents use these sites to meet new people and 45 (54.2%) respondents who use these sites for Instant message.

Mostly used social Networking sites

There are so many different types of social networking sites are there, which are used by the respondents. The Table 11 shows that the most important social networking sites used by the respondents and there purposes. It was found that majority of the respondents i.e. 79 (95.2%) use Facebook to Sharing Photos, 69 (83.1%) sharing and finding information, 63 (75.9%) Stay update, 60 (72.3%) Chatting with friends and 48 (57.8%) & 40 (48.2%) respectively to find Academic information and jobs. Averagenumber of the respondents usesTwitter, LinkedIn and Google Plus to sharing

Facebook	Google Plus	LinkedIn	Twitter	Total
69 (83.1%)	1	2	11	83
63 (75.9%)	5	0	15	83
60 (72.3%)	1	7	15	83
48 (57.8%)	10	10	15	83
40 (48.2%)	9	16	18	83
79 (95.2%)	1	3	00	83
	Facebook           69 (83.1%)           63 (75.9%)           60 (72.3%)           48 (57.8%)           40 (48.2%)           79 (95.2%)	FacebookGoogle Plus69 (83.1%)163 (75.9%)560 (72.3%)148 (57.8%)1040 (48.2%)979 (95.2%)1	FacebookGoogle PlusLinkedIn69 (83.1%)1263 (75.9%)5060 (72.3%)1748 (57.8%)101040 (48.2%)91679 (95.2%)13	FacebookGoogle PlusLinkedInTwitter69 (83.1%)121163 (75.9%)501560 (72.3%)171548 (57.8%)10101540 (48.2%)9161879 (95.2%)1300

Table 11: Mostly used social Networking sites

and finding information, Stay update, Chatting, Academic information and find jogs. The above result shows that majority of the students were using Facebook and Twitter on a regular basis.

Major Findings of the Study

- 1. The gender wise distribution indicates that out of 83 respondents 23% are female students and remaining 77% are male students.
- 2. The findings of the age wise distribution reveal that majority of the 40 (48.2%) respondents fall between the age group of 21-25.
- 3. The study shows that 100% of the respondents are well aware about social networking sites.
- 4. The study result indications that majority of the respondents were using Facebook and Twitter on a regular basis.
- 5. The study found that majority of respondents i.e., 68 (81.93%) visit the SNSs weekly.Out of 83 respondents, 54 (65.06%) users spend 1-2 hour in using social networking sites.Out of 83 respondents, 82 (98.8%) have to connects or to find theirs friends, The data emphasized that SNSs can be a good platform for Sharing Photos and finding information.
- 6. The study found that 69 (84.1%) of the respondents use SNS via mobile.
- 7. The findings of problems challenged while using Social Networking Sites reveal that majority of the respondents 54 (63.9%) expressed Lack of time.
- 8. The result found that for Entertainment 67(80.7%) purpose they use SNS and 58 (69.9%) use SNS for Education

## Conclusions

The current study focus on the use of Social Networking Sites by the user of Hare Krushna Mahtab State Library, Odisha. Social Networking Sitesprovidesa great platform to the students to interact with each other on virtual world. Students keep themselves updated invarious wayslike update their profiles, posting of messages, videos and photos, sharing professional and personal information at international online platform. In 21st century, SNSs have become a largest online platform to share piece information within a minute. The study found that most of the users of Hare Krushna Mahtab State Library, Odisha use social networking sites for different purposes and Facebook social networking site is the popular among the user of state library Odisha.

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# Authorship Pattern and Collaboration in Indian Journal of Medical Research [IJMR]

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## Abstract

In this article the author has studied the authorship pattern and collaboration trends in Indian Journal of Medical Research. The Single Vs. Multiple author contributions, Degree of collaboration is also studied.

Keywords: Bibliometrics; Authorship Pattern; Degree of Collaboration; IJMR.

#### Introduction

The Bibliometrics study is one of the important thrust areas to do research in Library & Information Science. Historically Bibliometrics methods have been used to trace relationships amongst academic journal citations and it is a set of methods used to study or measure texts and information.

Alan Pritchard (1969) has coined the word 'bibliometrics'. It has the application of mathematical and statistical methods were applied for analyses. There are three laws are used in Bibliometrics viz., Lotka's Law is used for productivity of authors contributing in a discipline or other fields; Bradford's Law is used for scattering of articles over different journals and Zipf's Law is used to find out frequency of occurrence of words in the text (word count).

In this article, the authors have examined the authorship pattern, Single Vs. Multiple authors publication and Degree of and collaboration in Indian Journal of Medical Research [IJMR] from 1997-2011.

#### About IJMR

The IJMR is a biomedical journal with International circulation. It publishes original communications of

Received on 17.05.2017, Accepted on 27.05.2017

biomedical research that advances or illuminates medical science or that educates the journal readers. The IJMR is a monthly journal published by Indian Council of Medical Research, New Delhi, India. The online version of IJMR with full-text access is also available at http://www.icmr.nic.in since 2003.

The primary data for the present study was collected from the Indian Journal of Medical Research printed version available in the Rajah Muthiah Medical College Library, Annamalai University.

#### **Review of Literature**

Lee (2000) has examined the publication rate of successful Ph.D scholars in the fields of Analytical chemistry, Experimental psychology and American literature. The results revealed that there was a decline trend in single authored papers in many fields. Pratt (2002) has utilized MEDLINE to perform a bibliometric analysis of the literature of AIDS for the period from 1981 to 1990. This study reported growth statistics for AIDS literature, number of different languages, countries of publication, and number of periodical titles. The AIDS literature grew from fewer than 700 entries from 1981 to 1983 to a cumulative total of 29,077 entries by the end of 1990. The greatest relative expansion came in 1983 with a 24-fold increase compared to the previous years.

Patra *et al.* (2006) have analyzed the growth pattern, core journals and authors' distribution in the field of bibliometric using data from Library and Information Science Abstract (LISA) and found that the growth of literature does not show any definite pattern. Verma et al. (2007) have revealed that majority of the articles

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in the journal of Annals of Library and Information Studies are two-authored. Sevukan and Jaideep Sharma (2008) have studied the bibliometric analysis of research output on Biotechnology research in some Indian Central Universities. Thanuskodi (2010) has discussed the research output performance of social scientists on social science subjects. The analysis cover mainly the number of articles, authorship-pattern, subject-wise distribution of articles, average number of references per articles, forms of documents cited, year wise distribution of cited journals etc. Ahila et al (2011) have studied the bibliometric analysis of research out on pharmacological research in India. Sanjeevi and Mahendran (2011) have studied the productivity of Research output on Lagoons. The authors have studied the authorship pattern, countrywise and form wise publication on Lagoon research during the period from 2000 to 2003. Sudhier Pillai (2013) has analyzed the authorship distribution in physics literature cited in the Ph.D. theses of University of Kerala. Further authors have applied K-statistical test, Chi-square test and Lotka's Law to find author productivity in Physics literature. Baskaran (2013) has studied the research productivity of Alagappa University from the year 1999-2011. The relative growth rate, doubling time, ranking of authors, etc. was also studied.

## Objectives

- To study the authorship pattern in IJMR
- To examine the Single Vs. Multiple authors publication in IJMR
- To find out the Degree of collaborations

# Results

The year-wise authorship pattern in the publication of article in Indian Journal of Medical Research is given in Table 1.

It could be noted that 119 authors have published papers in Indian Journal of Medical research in 1997 and it rose to 246 in 2011, indicating a 51.62 per cent

Total

119 (100.00)85 (100.00)76 (100.00)76 (100.00)73 (100.00)73 (100.00)65 (100.00)81 (100.00)112 (100.00)141 (100.00)195 (100.00)229 (100.00)254 (100.00)230 (100.00)246 (100.00)

Year	Single Author	Double Author	Triple Author	Four Author	Five Author	Six Author	
1997	22	19	28	18	11	21	
	(18.49)	(15.97)	(23.53)	(15.13)	(9.24)	(17.65)	
1998	3	12	13	18	13	26	
	(3.53)	(14.12)	(15.29)	(21.18)	(15.29)	(30.59)	
1999	4	12	18	16	8	18	
	(5.26)	(15.79)	(23.68)	(21.05)	(10.53)	(23.68)	
2000	-	18	10	12	14	22	
	(0.00)	(23.68)	(13.16)	(15.79)	(18.42)	(28.95)	
2001	-	8	17	18	9	21	
	(0.00)	(10.96)	(23.29)	(24.66)	(12.33)	(28.77)	
2002	5	13	18	13	14	10	
	(6.85)	(17.81)	(24.66)	(17.81)	(19.18)	(13.70)	
2003	-	2	23	14	12	14	
	(0.00)	(3.08)	(35.38)	(21.54)	(18.46)	(21.54)	
2004	6	15	17	20	10	13	
	(7.41)	(18.52)	(20.99)	(24.69)	(12.35)	(16.05)	
2005	5	13	31	20	18	25	
	(4.46)	(11.61)	(27.68)	(17.86)	(16.07)	(22.32)	
2006	15	25	17	19	22	43	
	(10.64)	(17.73)	(12.06)	(13.48)	(15.60)	(30.50)	
2007	58	34	27	19	25	32	
	(29.74)	(17.44)	(13.85)	(9.74)	(12.82)	(16.41)	
2008	44	50	42	31	19	43	
	(19.21)	(21.83)	(18.34)	(13.54)	(8.30)	(18.78)	
009	34	44	44	36	38	58	
	(13.39)	(17.32)	(17.32)	(14.17)	(14.96)	(22.83)	
2010	45	49	31	26	21	58	
	(19.57)	(21.30)	(13.48)	(11.30)	(9.13)	(25.22)	
2011	40	38	41	30	27	70	
	(16.26)	(15.45)	(16.67)	(12.20)	(10.98)	(28.46)	

377

(18.35)

 Table 1 : The Authorship Pattern in Indian Journal of Medical Research

261

(12.70)

474

(23.07)

2055

(100.00)

310

(15.09)

Total

281

(13.67)

352

(17.13)

increase in the period of analysis. In total 2055 authors have published papers in Indian journal of medical research during the period 1997 to 2011. Out of the total authors published paper in Indian journal of medical research, 13.67 per cent of them published single authors papers, 17.13 per cent of them published double authored papers, 18.35 per cent of them published triple authored papers, 15.09 per cent of them published four authored papers, 12.70 per cent of them five authored papers and 23.07 per cent of them published six authored papers.

It could be seen clearly from the above table, 2055 authors have published papers in Indian journal of medical research during the period 1997-2011. Out of the total published authors, six authored papers rank the first position three authored paper the second, triple authored papers the third, four authored papers the fourth, single authored paper the fifth and fiver authored papers the last.

Table 2: Single Vs. Multi Author Papers Published in Indian Journal of Medical Research

Year	Singl	le Authored	Mul	ti Authored	Total
	Papers	Percentage	Papers	Percentage	
1997-2002	34	6.7	468	93.2	502
2003-2007	84	14.1	510	85.9	594
2008-2011	163	16.9	796	83	959
Total	281	13.7	1774	86.3	2055

From the above table it is clearly noticed that the single authored contributions for each phase were in increasing trend when compared to multiple authored percentage. Out of 2055 authors, multiple author contributions were higher 86.3% when compared to single authored contribution (13.7%).

Table 3: Degree of Collaboration

Year	Degree of Collaboration
1997-2002	0.93
2003-2007	0.85
2008-2011	0.83

The analysis of the extent of collaboration in Indian journal of medical research reveals the following facts. The first and second phase of the study period from 1997 to 2002 stood first in the order (0.93) of collaborative research. The second phase of the study period 2003-2007 recorded second in the order (0.85) of collaboration. The third phase of the study period 2008-2011 recorded third in the order (0.83) of collaboration. The study interpreted that single contributed papers maintained the low profile (13.7%) among papers published in Indian journal of medical research. Multi authored contributions are traced with the maximum per cent 86.3. In recent years, medical research intent to take collective participation in research problem solving activities, it has resulted in the inclining of single author papers and thereby decreased the multiple author papers.

## Conclusion

The findings of authorship pattern in Indian

Journal of Medical research reveal the following facts.

- It is observed from the result of the study that 2055 authors have published papers in Indian journal of medical research during the period 1997-2011. Out of the total published authors, six authored papers rank the first position triple authored paper the second, double authored papers the third, four authored papers the fourth, single authored paper the fifth and fiver authored papers the last.
- The findings of collaboration in Indian journal of medical research reveals the following facts in recent years, medical research intent to take collective participation in research problem solving activities, it has resulted in the inclining of single author papers and thereby decreased the multiple author papers.
- The findings of Productivity in papers published in Indian journal of medical research reveals the following facts. It is observed from the result of the study that in general when the number of published papers increases, the number of contributed authors decreases. More number of publications by a researcher in any field requires high degree of inquisitiveness, competences, efficiency, perseverance and exposure to nascent literature. That is why only a few authors have contributed more number of papers. Further author productivity is influenced by the nature of institution in which the researchers are working are of specialization and availability of infrastructure facility. In medical science research majority of the authors have made either one paper publications or two paper publications.

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# Bibliometric Analysis of Indian Journal of Library and Information Science

# S. Rajeswari\*, K. Praveena\*

## Abstract

Bibliometric analysis of 194 articles published in the Indian Journal of Library and Information Science, Volumes 6 to 10 during the year 2012-2016 has been undertaken for the study. It has been carried out to observe the distribution of contributions, authorship pattern, distribution of contribution, and number of pages used in each volume. Results indicate that the number of contributions is increasing in successive volumes. Highest numbers of papers have been written by joint authors. The growth and popularity of this journal is found to be showing an upward trend.

Keywords: Bibliometric Analysis; IJLIS; authorship pattern.

### Introduction

Bibliometrics is a type of research method used in library and Information Science. It is a quantitative study of various aspect of literature on topics and is used to identify the pattern of publication, authorship and secondary journal coverage with the objective of getting an insight into the dynamics of growth of knowledge in the area under consideration.

British librarian a Pritchard first introduced the term bibliometrics as the "application of mathematics and statistical methods to books and other media of communication". A more elaborate definition has been put forward by L. Egghe who defined it as "the development and application of mathematical models and techniques to all aspects of communication".

#### Source Journal

Indian Journal of Library and Information Science

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Received on 19.04.2017, Accepted on 09.05.2017

(IJLIS), has been selected as the source journal for the present study, It is one of the journal in library and information science and started publication in 2007 with three issues in an year.

#### **Objectives**

- 1. To examine the authorship pattern of the contribution.
- 2. To analyses the volume wise distribution of contributions and to find out the average number of contribution per volume.
- 3. To observe the number of pages used in different issue of various volume.
- 4. Dr. Subramanian's formula to analyses the degree of collaboration.
- 5. To indicate volume wise geographical distribution of contribution.

#### Scope

An attempt has been made to analyses the contribution in volumes 6- 10. The study period is from 2012 to 2016 i.e the five years of journal issues which are considered for this study.

The contribution of volumes of authorship, number of pages in each issue and volume was noted on cards. All the cards were subsequently examined, observed, analyzed and tabulated for making observations.

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#### Analysis

An indicated in Table 1 the total number of contribution in 18 issue of 5 volumes of the source journal is 194 of which the highest number of contribution are in the volume 8;44(14.10%), followed

by vol.7; 43(13.78%), vol.6; 41(13.14%), vol.10; 35(11.22%) and vol.9; 31(9.94%).

Table 2 presents the distribution on contribution issue wise. It is observed that the number of contributions is increasing in successive issues.

Table 1: Distribution of Contribution (Volume wise)

Year	Volume No	No. of Issues	No. of Contribution	Percentage
2012	6	4	41	21.14
2013	7	4	43	22.16
2014	8	4	44	22.68
2015	9	3	31	15.98
2016	10	3	35	18.04
5 years	5Volumes	18	194	100

Table 2: Distribution of Contribution (Issue wise)

Year	I issue	II issue	III issue	III Supplementary issue	Total
2012	9	11	11	10	41
2013	12	10	18	13	43
2014	11	13	13	7	44
2015	9	9	13	-	31
2016	8	18	9	-	35
	49	61	54	30	194

Table 3: Authorship pattern of Contribution

No. of Authors	No. of Contributions	Percentage
One	67	34.54
Two	95	48.97
Three	27	13.91
Above three	5	2.58
	194	100

Table 4: Authorship pattern of Contribution (Volume wise)

Year	One author	%	Two author	⁰∕₀	Three author	%	Above Three author	%
2012	17	25.37	19	20	5	18.52	-	-
2013	14	20.89	19	20	7	25.92	3	60
2014	19	28.36	19	20	5	18.52	1	20
2015	6	8.96	20	21.05	5	18.52	-	-
2016	11	16.42	18	18.95	5	18.52	1	20
-	67	100	95	100	27	100	5	100

#### Table 5: Calculation of degree of collaboration

Year	Single author	Multi author	Total	Collaboration
2012	17	24	41	0.585
2013	14	29	43	0.674
2014	19	25	44	0.568
2015	6	25	31	0.806
2016	11	24	35	0.685
-	67	127	194	0.655

Table 3 and 4 reveals that the two authored paper numbering 95(48.97%) tops the list in five years followed by single authored paper 67(34.54%), three authored papers 27(13.91%) and above three authored papers 5(2.58%).

Table 5 Shows the degree of collaboration is the concept of the ratio of the total number of research papers and the total collaborative research papers

during a certain period of time.

The suggested Subramanian's formula is

C = Degree of collaboration in a disciplineNm = Multi authored papers

Ns = Single authored papers

The degree of collaboration = 0.655

A study of data in table 5 indicates the degree of collaboration in the main articles of the India Journal

Table 6: Average pages: per volume per contribution

of Library and Information Science (2012-2016). The degree of collaboration is 0.655 during the study period. i.e. Out of the total number of main articles published, only 65.46% of them are joint publication.

Year	Volume No	<b>Total Pages</b>	No. of Contribution	Average
2012	6	335	41	8.17
2013	7	381	43	8.86
2014	8	389	44	8.84
2015	9	270	31	8.71
2016	10	284	35	8.12
	5 volumes	1659	194	

Table 6 reveals the average pages per volume per contribution.

Average pages per volume = 1659 / 5 = 332

Average pages per issue = 1659 / 18 = 92

Average pages per contribution = 1659 / 194 = 8

**Table 7:** Geographical Distribution of Contribution (Volume wise)

Number of pages in each volume is increasing as is the number of contribution. These factors clearly point out that the journal is becoming popular day by day as more and more researchers round the globe are contributing in the journals.

S. No.	Name of State	2012	2013	2014	2015	2016	Total	%
1.	Andhra Pradesh	1	-	1	-	1	3	1.55
2.	Delhi	2	2	-	3	2	9	4.64
3.	Haryana	4	5	2	4	2	17	8.76
4.	Karnataka	15	10	12	9	4	50	25.77
5.	Kerala	-	-	-	-	2	2	1.03
6.	Maharashtra	2	6	4	-	2	14	7.22
7.	Madhya Pradesh	1	-	1	-	2	4	2.06
8.	Mizoram	-	1	-	-	-	1	0.51
9.	Odisha	1	-	2	2	2	7	3.61
10.	Pondicherry	1	-	-	-	1	2	1.03
11.	Punjab	-	1	-	-	2	3	1.55
12.	Tamil Nadu	9	9	9	8	7	42	21.65
13.	Uttar Pradesh	-	4	5	3	6	18	9.28
14.	Uttarakhand	-	-	1	-	-	1	0.51
15.	West Bengal	3	4	4	1	2	14	7.22
16.	Other Countries	2	1	3	1	-	7	3.61
	Total	41	43	44	31	35	194	100

Table 8: Ge	ographical D	istribution of	t Contribut	ion

S. No.	Name of State	Total	%
1.	Karnataka	50	25.77
2.	Tamil Nadu	42	21.65
3.	Uttar Pradesh	18	9.28
4.	Haryana	17	8.76
5.	Maharashtra	14	7.22
6.	West Bengal	14	7.22
7.	Delhi	9	4.64
8.	Odisha	7	3.61
9.	Other Countries	7	3.61
10.	Madhya Pradesh	4	2.06
11.	Andhra Pradesh	3	1.55
12.	Punjab	3	1.55
13.	Kerala	2	1.03
14.	Pondicherry	2	1.03
15.	Mizoram	1	0.51
16.	Uttarakhand	1	0.51
	Total	194	100

Table 7 & 8 reveals that the contributions have emanated from 15 Indian States and some are from other countries as well. The geographical distribution of the contribution has been decided on the basis of the affiliation and address of the first author. From the data analysis it is observed that the highest numbers of publication are from Karnataka with 50(25.77%) papers.

Next come Tamil Nadu with 42(21.65%) papers followed by Uttar Pradesh with 18(9.28%) papers. Haryana ranks fourth in the list with 17(8.76%) papers. It may be noted that the first four states are responsible for 65.46% of among 15 states. It is also noticed that the least number of papers i.e only one paper was emanated by Mizoram and Uttarakhand.

#### Findings

- 1. The contribution of articles to each of Indian Journal of Library and Information Science is constantly increasing from year to year.
- 2. The average number of pages per volume is 332.
- 3. Two authored paper are found to be the highest followed by single-authored and then three-authored papers.
- 4. The degree of collaboration in Indian journal of Library and Information Science is found to be 0.655.
- 5. The papers have emanated from 15 Indian states and some are from other countries as well.

#### Conclusion

The Journals have only a short history of nearly 10 years. Based on the study period i.e 2012-2016. In this short period the journal has tried to keep up its main aim of raising issues in field of Library and Information Science. The journal has published 194 articles during the period of study. The maximum numbers of articles 22.68% were published in the year 2014. The present study reveals that the maximum numbers of contributors are joint authors with 65.46%.

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# Digital Preservation for Libraries: Planning / Process and Approaches

# V.R. Rajan\*, S. Barathi\*\*, D. Sindhujha\*\*

## Abstract

This paper discusses about the digital preservation – planning, process and approaches. It also deals with the major part process, issues and technologies involved in preservation of digital materials, explains the overview of technological approaches and strategies to digital preservation and challenges, focuses on operational digital preservation systems specifically in information resource centre (IRC). It considers the wide range of digital objects of interest to IRC, including e-journals, technical reports, e-records, project documents, scientific data, etc. The paper also discusses archiving based on format types – text, data, audio, video, etc. Design, methodology, approach. And also find out that the Digital preservation of documents restores it from loss, theft and decay.

**Keywords:** Digital Preservation; Preservation Planning; Digital Resources; Preservation Initiatives; Preservation Strategies.

## Introduction

"The Goal of Any Preservation Program is to ensure long – term, ready access to the Information Resources of an Institution."

### Abby Smith "Preservation in the Future Tense"

Digital preservation can be defined as the combination of policies, strategies and actions to ensure access to and accurate rendering of authenticated reformatted and born digital content over time, regardless of the challenges of media failure and technological change. Digital preservation is a general term for a set of services with one goal: keeping your data safe so that it can be accessed in the future. Digital preservation is the management of digital information over time. It takes the form of processes and activities that ensure continued access

Received on 10.04.2017, Accepted on 24.04.2017

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to information and all kinds of records, both scientific and cultural heritage, that exists in digital form. It is also about the preservation of digital assets and their associated metadata. As Marcum noted in 1996, "Preservation is a fundamental responsibility of libraries and archives of record", this paper discusses Digital preservation aims to ensure that a digital collection remains usable, regardless of the inevitable changes in technology the future will bring. Without the appropriate preservation methods in place a digital collection can easily become inaccessible and so useless in just a few years. To be sure, the preservation imperative has been imperfectly carried out in the print environment, but the problem grows even more complicated in the digital world

#### **Purpose of Preservation**

To preserve a complete record of all important information, so that data has meaning in the future, ensuring that it meets the requirements of funder mandates, audits, restoration of missing content and re-use of data. Preservation systems retain data for many years.

Digital Preservaton (Digital Documents Preservation)

• The aim of digital preservation is long-term, errorfree storage of digital information, with the means

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of retrieval and interpretation, for the period of time that information is required

- Digital preservation refers to the series of managed activities necessary to ensure continued access to digital materials for as long as necessary
  - Long-Term Preservation

Continued access to digital materials, or at least to the information contained in them, indefinitely

Medium-Term Preservation

Continued access to digital materials beyond changes in technology for a defined period of time but not indefinitely

### Short-Term Preservation

Access to digital materials either for a defined period of time while use is predicted but which does not extend beyond the foreseeable future and/or until it becomes inaccessible because of changes in technology

### Digital Preservation - Needs

The digital world is a place of rapid technological and organizational changes, which impacts on the continuing use of digital resources. All types of digital resources need preservation. Some of the digital resources listed below:



Digitally Reformatted

Digitized versions or surrogates of physical items

#### Born Digital

Digital resources that have no analogue counterpart

#### Individual resources

Texts, still and moving images, sound recordings, etc.

## Collective resources

Websites, e-journals, wikis, catalogues, etc

### Data Sets

Scientific and cultural data comprising multiple individual pieces of data

Communication records

Email, instant messages, etc

### Digital Preservation

Contains a wide range of information, with links to tutorials, videos, blogs, to help provide some basic context. It also includes an overall definition of digital preservation: the series of managed activities necessary to ensure meaningful continued access, for as long as it is required, to digital objects and materials.

#### Preservation by Format

Includes links to suggested approaches for preserving photographs, audio, video, email, documents, and websites. Much of this is focused on smaller, personal collections.
#### Digital Storage, Cloud computing and Personal Backup

Includes links to basic information on cloud storage and other backup options, as well as a timeline history of digital storage

#### Process of Digital Preservation

#### Digital Assets

- Creating & shielding Assets
- Accessing & Discovering Assets
- Managing & Preserving Assets
- Understanding & Awareness of Assets

#### Digital Preservation: A Four Step Process

To preserve digital records, the National Archives uses its digital preservation software to convert proprietary file formats to openly-specified preservation file formats.

#### There Are Four Steps in this Process

- Manifest A list is created of all digital records to be preserved.
- 2. Quarantine Records are checked for viruses and integrity.
- Preservation Records are converted to preservation file formats.
- 4. Storage Records are stored in the digital archive.

#### The Archives Digital Preservation Software

- Captures the essential elements of digital records
- Allows digital records to be retrieved from the digital archive at any time
- Continually checks the integrity of records in the digital archive.

#### Approaches to Preservation

The protection and long-term preservation of a project's digital output and metadata needs to be considered even before digitization begins. Decisions made at the earliest stages of a project can and will have an impact on the effectiveness of the whole digital preservation strategy. It is particularly important that digitization projects are fully documented as they progress. Full documentation of technical solutions and project delivery will give those undertaking the preservation strategy an understanding of how the project was conceived, developed and produced. Strategies have to be put in place to guarantee that the collection survives through technological changes, ensuring its continued accessibility and usability. There are three common approaches to digital preservation:

- Migration: Itdescribes the process of copying content from one format (such as a CD-ROM) onto a newer format (such as a solid state flash drive).
- Refreshment: A related process is refreshment. Refreshment involves copying data onto a newer example of the same format (such as from an old CD-ROM to a new CD-ROM).
- *Emulation*: Emulation is a more involved process of accessing data on a system other than the one it was made for. Commonly, this will be because an original system is no longer available. Playing vintage computer games on a contemporary games emulator is a good example.

#### Preservation in Practice

Whichever approach or combination of approaches is chosen, it is often helpful to make a distinction between a 'master generation' of digital data and at least one surrogate 'delivery generation'. The master generation should contain as much intellectual, visual or audio content as possible and must be saved in a standard (non-proprietary) file format and it should preferably be duplicated across multiple locations. Delivery generations of data, however, may be re-sized, compressed, and saved in whichever format is suitable for delivery to the user. Delivery versions are typically of lower quality (more compressed) than their original master files. Defining the status and thereby the relative importance of a file helps immensely in the task of preservation

#### Digital Preservation Strargies

#### Issues

Digital preservation encompasses a range of strategies, processes and activities, with a variety of associated issues to be considered. Examples are:

*Long-term*: May extend indefinitely and depends on the need for continuing access to a resource in one or more specific formats. The lifetime of a specific resource is determined by the degradation and/or format accessibility of that resource.

*Retrieval:* Obtaining digital files from storage without corrupting the stored files.

Interpretation: The digital files must be decoded and

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transformed into usable representations, for machine processing and/or human access.

*Rendering:* Making a digital file available for a human to access.

*Re-digitizing:* Some early digitized resources are in formats that are, or are rapidly becoming, obsolete. Since it can be the case that poor results are obtained by migrating from the obsolete format to a newer format, it may sometimes be better to re-digitize from the original.

*Emulation:* Where specific playback equipment is no longer available, emulation software may need to be written in order to access the informational content using a different device.

*Degradation:* The process by which parts of a resource are lost over time. This may occur as a characteristic of a format (it becomes a less accurate representation over time) or a consequence of copying from another file or migrating from one format to another.

*Effort:* It appears that digital preservation requires more frequent and ongoing action than other types of media. The consequent requirement in terms of effort, time and money

#### Technical Strategies

Digital preservation to date has relied on two main technical strategies: standards and migration. Technical standards form a foundation for much of what makes digital libraries possible. Standards and protocols for storage, data formats, bibliographic control, display, retrieval, transport, and distribution are imbedded in the infrastructure that make digital libraries accessible, manageable, and useable. In the area of digital preservation, standards issues primarily concern encoding, data formats, and representation schemes. Archivists and librarians tend to favor open standards over *de facto* or proprietary standards for two reasons. First, open standards are published and readily available whereas *de facto* standards

#### **Operational Models and Programs**

Digital preservation is difficult to untangle from many other digital library functions. Preservation concerns may affect collection development if a digital library limits the materials it will acquire to those that conform to designated standards. Likewise, preserving digital materials would be pointless if a digital library could not provide a means for accessing the materials. The inter-relationships between collection development, preservation, and access, however, add levels of complexity to digital library development that are difficult to address without some method of breaking the inter-dependencies down into reasonable and solvable problems. These closely related issues also influence how digital libraries are designed and administered. Recent conceptual work on archival functions and efforts to develop operational digital repositories provide some useful frames of reference for integrating digital preservation into digital library design and operations.

#### Current Research and Ongoing Issues

The increasing amount of research underway that directly or indirectly addresses concerns about the longevity of information is another encouraging sign that digital archiving has become an important issue for digital libraries.

 A number of open source products have been developed to assist with digital preservation, including Archivematica, DSpace, Fedora Commons, OPUS, SobekCM and EPrints. The commercial sector also offers digital preservation software tools, such as Ex Libris Ltd.'s *Rosetta*, Preservica's Cloud, Standard and Enterprise Editions, CONTENTdm, Digital Commons, Equella, intraLibrary, Open Repository and Vita.

#### Examples of Digital Preservation Initiatives

- The Library of Congress founded the National Digital Stewardship Alliance which is now hosted by the Digital Library Federation.
- The British Library is responsible for several programmes in the area of digital preservation and is a founding member of the Digital Preservation Coalition and Open Preservation Foundation. Their digital preservation strategy is publicly available. The National Archives of the United Kingdom have also pioneered various initiatives in the field of digital preservation.

# Conclusion

Recent progress in digital preservation is a consequence of the growing awareness of longevity as a critical issue for sustainable and useable digital libraries, increased investments in research and development, and efforts to focus on discrete and potentially solvable aspects of the problem. These issues will provide ample opportunities for research, experimentation, and development for years to come.This paper has described a methodology for expanding existing offerings and building new ones. While these offerings will undergo transformation, we are building them with the certainty that users in centuries to come will find our early collaborative efforts in digital preservation to have been valuable.

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# IT Based Library and Information Services in Agricultural University Libraries in South India: A Study

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# Abstract

The present study highlights the hardware and software facilities in agricultural university libraries in south India. It is evident from the study that all five agricultural universities are having computer facilities and one has developed their own library software and other universities are having commercial software. It also highlights access of networks, information services and barriers to information technology applications. The impact of information technology is also assessed in the study.

Keywords: Information technology; Agricultural library.

#### Introduction

The progress of research in agricultural fields and improvement of production essentially requires timely supply of information to agricultural scientists. It is not possible to achieve self-sufficiency in food production without adequate information supply to agricultural scientists. The concentration of efforts is probably efficacious in informing agricultural scientists of improved methods in agriculture. It also includes an unfortunate parochialism affecting both the agricultural scientists and the information industry. To promote an effective working relationship between research workers who generate new agricultural knowledge and farmers who stand in need of such knowledge, the information system acts as 'middleman' in a position to deliver such knowledge to the required points of distribution. The sources of agricultural information are varied in kind and widely scattered in location with an equally widespread distribution. In the same way agricultural information users are also equally scattered. To bridge this gap, we need agricultural information system.

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Received on 13.06.2017, Accepted on 28.06.2017

So far as the structure of the agricultural information service is concerned, we should remember that in this complex world it is not possible far any individual agricultural library to meet the complete information requirements of the users. The user's requirements are becoming more and more diverse in the quantities and qualities. We also find time factor as pressure on the supply of agricultural information. There is also an imperative need for widening information coverage, extending the sphere of services and accelerating the speed in the supply of information. It is essential to build the requisite information infrastructure for agricultural scientists within the state and nation. This is particularly relevant in the context of 'food for all'. In pursuit of scientific excellence, agricultural information infrastructure is a must and agricultural information service facility keeps track of the latest scientific, agricultural and technological advancement over the world.

# Analysis and Interpretation of Data: Librarians Point of View

Thus a university library must have scientifically organized and effectively administered library with all required reading materials in sufficient numbers, so that it becomes an intellectual hub of the university. The university library is not merely a storehouse of books and non-book materials and preservation of them, but it is a dynamic instrument of education. For this it should maintain co-operation between different faculties and staff to promote effective use of the library. If the collection is to be used in the library, there should be good catalogues, aids and guides. It would be a great drawback if there were no sound catalogue. Apart from the catalogues, there should be a reference librarian to pick literature available in the library. University Library, to demonstrate its usefulness, its ability for speedy service must employ reference personnel.

Name of the Agricultural University		Place	Abbreviations	Year of E	stablishment
University of Agricultural Sciences		Bangalore	UASB	-	1964
Acharya N.G. Ranga Agricultural Uni	versity	Hyderabad	ANGRAUH	-	1964
Tamil Nadu Agricultural Universi	ity	Coimbatore	TNAUC		1971
Kerala Agricultural University		Thrissur	KAUT		1972
University of Agricultural Science	es	Dharwad	UASD	-	1986
Table 2: IT Based Library and Informa	ation Servi	ces in Agricultural	University Libra	ries in South Ir	ndia
IT Based Library and Information Services	Libraria	ins Response in Ag Library	ricultural Universi and Information S	ity Libraries ab Services	out IT Based
	UASB	ANGRAUH	TNAUC	KAUT	UASD
Lending			$\checkmark$	$\checkmark$	
Current Awareness Service				$\checkmark$	
SDI	$\checkmark$			$\checkmark$	
Fax	$\checkmark$	$\checkmark$		$\checkmark$	
CD-NET	$\checkmark$	$\checkmark$		$\checkmark$	
Dial Up Service	$\checkmark$			$\checkmark$	$\checkmark$
Electronic Bulletin Board System				$\checkmark$	
CD-ROM Search	$\checkmark$	$\checkmark$		$\checkmark$	$\checkmark$
Web Based OPAC	$\checkmark$	$\checkmark$			
TELENET				$\checkmark$	
Video Conference				$\checkmark$	

Table 1: Year wise Establishment of Agricultural University Libraries in South India

To know growth and establishment of agricultural university libraries in south India under the study, respondents were requested to provide the year of establishment of their libraries. The collective respondents are given in Table 1 for necessary statistical interpretation. It is observed from the table that University of Agricultural Sciences Library, Bangalore and Acharya N. G Ranga Agricultural University Library, Hyderabad were established in the year 1964, and they are found to be the oldest universities under the study, followed by Tamil Nadu Agricultural University Library, Coimbatore, was established in the year 1971, Kerala Agricultural University Library, Thrissur was established in 1972 and finally University of Agricultural Sciences Library, Dharawad, was established in1986.

Information Technology brings about almost a revolution in the functioning of a library, it has changed the way of information handling and disseminating. Computer is highly productive not only for library operations and management but also equally useful for library users. The university libraries are playing the leading role in the national development to draw attention of the government and other role-playing agencies.

Information Technology is playing a predominant

role in library services. Today almost all the university libraries are adopting IT applications in order to speed up the services. Table 2 shows that the different IT based services available in libraries. It shows that University of Agricultural Sciences Library Bangalore is offering SDI, FAX, CD-NET, CD-ROM search and Web-Based OPAC services. Acharya N. G. Ranga Agricultural University Library Hyderabad, is providing FAX, CD-NET, CD-ROM and Web-Based OPAC services. Tamil Nadu Agricultural University Library Coimbatore, is offering lending services, CAS and FAX services, Kerala Agricultural University Library Thrissur is offering almost all same such as Lending, CAS, SDI, FAX, CD-NET, Dial-Up, Electronic Bulletin Board, CD-ROM Search, Tele-Net, and Video Conference services. The University of Agricultural Sciences Library Dharwad is a poor one as for as IT applications are concern. It offers only Dial-UP and CD-ROM services to the user community.

There are various barriers in successful applications of IT in the libraries. We have listed various barriers for IT application and request them to tick which one they faced. The sought information is tabulated in Table-3. The table clearly shows that as for as University of Agricultural Sciences Library, Bangalore is concerned the major barriers for IT application are insufficient funds, inadequate trained IT personnel.

Acharya N.G. Ranga Agricultural University Library, Hyderabad is facing the barrier like insufficient funds, inadequate provision of recurring cost and operational cost going higher year by year. As for as Tamil Nadu Agricultural University Library, Coimbatore, is concern it faced the barriers like insufficient funds, inadequate provision of recurring funds, inadequate trained IT personnel's, lack of IT knowledge on part of users, lack of professional recognition by the authorities. It often disturbs the routine work of the library. Utilization of IT application will increase the number of supporting

Table 3: Barriers of IT Applications in Agricultural University Libraries in South India

Barriers of IT Applications	Librarians Response in Agricultural University Libraries about Barriers of IT Applications				
	UASB	ANGRAUH	TNAUC	KAUT	UASD
Insufficient Funds	$\checkmark$	$\checkmark$	$\checkmark$		
Inadequate provision of Recurring cost		$\checkmark$	$\checkmark$		
Inadequate trained in IT personal	$\checkmark$		$\checkmark$	$\checkmark$	$\checkmark$
No support from the authority for applications in the library					
Lack of IT Knowledge on The part of the users			$\checkmark$		
The library professionals are not deputed in learning IT				$\checkmark$	
Lack of professional recognition			$\checkmark$		
It often disturb the routine work of the library			$\checkmark$		
Utilization IT applications will increase the number of Support staff			$\checkmark$	$\checkmark$	
IT affects regular budgeting provision					
IT takes major share from the library					
Annual maintenance cost of IT products affects the collection development			$\checkmark$	$\checkmark$	
Operational cost are exceeding year By year		$\checkmark$	$\checkmark$	$\checkmark$	
Higher salaries for a trained staff also affecting the collection development			$\checkmark$	$\checkmark$	

Table 4: Impact of IT Applications in Agricultural University Libraries in South India

Impact of IT Applications		Librarians Response in Agricultural University Libraries about Impact of IT Applications				
	UASB	ANGRAUH	TNAUC	KAUT	UASD	
IT applications are improves the Quality of Library and Information Service	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	
IT improves the efficiency of the Library	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	
IT uses to enhance the knowledge and experience	$\checkmark$	$\checkmark$	$\checkmark$		$\checkmark$	
It promotes integration among the organization	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	
IT applications uses to improve the communication		$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	
facilities						
IT applications helps to get right information at the right		$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	
place						
IT applications improves the status of the Library		$\checkmark$	$\checkmark$	$\checkmark$		
IT application reduces the work load of the Library staff		$\checkmark$	$\checkmark$	$\checkmark$		
IT application takes over the traditional way of		$\checkmark$		$\checkmark$		
information handling in the library						
It helps in effective resource sharing and networking	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	
IT application allow more control over the Library	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$		
Utilization of IT application make library more stable		$\checkmark$	$\checkmark$	$\checkmark$		
Utilization of IT applications reduced the number of	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$		
professional staff						

staff, which affects regular budgeting provision. It takes major share from the library, annual maintenance and operational cost go high year by year, and higher salary for trained staff also affects the collection development of the library. Kerala

Agricultural University Library Thrissur faces the following barriers of IT applications such as inadequate trained personnel, the library personnel's are not deputing to learn IT applications, and utilization of IT will increase the supporting staff. It

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takes major share of the library. Annual maintenance cost goes high, which affects the collection developments, operational cost is more and higher salaries for trained personnel are also affect the collection development. As for as University of Agricultural Sciences Library Dharwad is concerned it faces only the inadequate trained personnel's to introduce IT application in the library. It is observed from the table that, there were no such big hurdles for IT applications. But there must be whole-hearted support from the staff. In addition to this the financial support from the authorities is also required.

Table 4 shows clearly that all most all the libraries under the study have agreed that there was a wonderful impact of IT applications which has improve has the quality of library and information service. IT improves the efficiency of the Library and also enhance the knowledge and experience, It promotes integration among the organizers, IT applications help to improve the communication facilities and helps to get right information at the right place and also improves the status of the library, IT application reduces the work load of the library staff and also takes over the traditional way of information handling in the library, It helps in effective resource sharing and networking. Utilization of IT application make, library more stable and reduces the number of professional staff.

# Conclusion

Since India is a land of farmers, here Socio-Economic developments depend on the education of the farmers and their information level. They need information to become enlightened and rational so as to take quick and correct decisions to improve the rural life. The nature and efficiency of the information services provided by the agricultural university libraries vary from one to another, owing to the whole range of interest of the user community. However with the emergence of the computer and revolutionary changes in communication technology, it has become possible for a agricultural university libraries to provide a variety of technology based information services to the users community with a vide range of interests, which was not possible earlier. As a matter of fact all these activities and services are interdependent, interrelated and direct towards maximization of the usefulness of the agricultural university library systems. To overcome this, the librarians should approach their concern authorities and get adequate funds to meet the IT based information requirements of the users.

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# The Role of Digital Library in Open and Distance Learning: Issues and Challenges

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### Abstract

In ODL system of learning the teacher will be remote from his students by both space and time. Distance learning has become more popular in recent times as an alternative to the traditional form of education. Distance students' characteristics are different from students of traditional universities. Here the students are mainly adult learners, employed, housewives, rural students, and the students who don't have access to higher education in formal ways. ODL students will have higher motivation and are willing to take responsibility for their own education and often experience a feeling of isolation and remoteness from other students. However, distance learning demand much use of library resources, audio-visual media and information and communication technology. Within this distance learning environment, the mode of teaching, as well as learning, has been shifted from physical to virtual environment. In the present digital environment, learning is possible through web-based library services as a medium and digital library as a gateway with the help of integrate library management system. This paper discusses the web-based library services/practices employed in distance librarianship and the issues and challenges related.

Keywords: Digital Library Services; ODL Learners; Virtual Education.

#### Introduction

Distance learning is often described as the formalized learning received while the student is in a location outside the university campus. Both the teacher and student are expected to have minimal physical contact, but much reliance on electronic communication and independent studying. A wide range of technological options is available to the distance educator and learners. They fall into four major categories: (i) Correspondence Model: The Correspondence Model regarded generally as the first generation of distance education based solely on print technology; (ii) Multimedia Model: This model entails the use of highly developed and refined teachinglearning resources, including printed study guides,

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Received on 20.02.2017, Accepted on 04.03.2017

selected readings, videotapes, audiotapes, and computer-based education (CBE), including computer-managed education (CME), computer assisted education (CAE), and interactive video (disk and tape); (iii) Tele-learning Model: This third generation of distance education is based on the use of information technologies, including audioteleconferencing, video conferencing and broadcast television/radio with attendant audioteleconferencing; (iv) Flexible Learning Model: This emerging fourth generation of distance education promises to combine the benefits of high-quality CD-ROM based interactive multimedia, with the enhanced interactivity and access to an increasingly extensive range of teaching-learning resources offered online by connection to the Internet.

Distance education is planned learning that normally occurs in a different place from teaching and as a result requires special techniques of course design, special instructional techniques, special methods of communication by electronic and other technology, as well as special organizational and administrative arrangements. The extensive use of information technology in the delivery of distance services and the use of e-mail, faxes and 24 hour messaging services are examples of distance

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strategies that have also been applied to regular library services.

The provision of quality library services to those who learn at a distance is one of the challenging developments that have occurred in contemporary librarianship. Distance education has led to the development of specialized library and information services that can appropriately be called distance librarianship. In traditional library services, students go to the library to access the range of information services that they need to satisfy their learning needs. In distance education, a cocktail of modalities has to be used to take library services to distance learners. Thus, the distance applies not only to education but also to the ability of those who study at distance to access library services. Librarians, distance educators, and administrators must, therefore, adopt new strategies to ensure that quality library and information services are available to those who learn at a distance. Consequently, distance learning has led to the development of new institutional responsibilities in relation to library and information services based on the need of distance learners. Distance education has fostered, enhanced and extended the nature of collaborative relationships between the stakeholders in distance education systems. For library services, it is particularly important to collaborate with agencies that are external to the library because without their assistance it would be impossible to provide quality library and information services to distance learners. These new relationships affect every facet of the delivery of library and information services to distance learners. Librarians have to develop important links with distance education administrators in order to ensure that the necessary policy arrangements are instituted to deliver library services to their distance students.

Distance education has also added to the pool of opportunities for librarians to become creators of information either through the development of new materials or when they repackage information to suit particular needs. The repackaging of information or value adding services that librarians contribute information used in distance learning systems adds to the teaching role that librarians to this system of education. Distance librarianship demands that libraries and librarians recognize that their role has transformed from being custodial in orientation to become cutting edge in nature particularly with respect to the delivery of information services. Distance education and librarianship demand that students are placed at the center of the educational paradigm. In addition to traditional delivery

mechanisms libraries must introduce bold and innovative strategies into their delivery process. The strategies must be deployed to deliver the gamut of services that distance learners require including document delivery; bibliographic instruction; information literacy instruction; reference services; interlibrary loans and access to electronic resources.

Many libraries use electronic communication as the medium of choice to maintain contact with students making it possible for students to use E-mail as a means of sending and receiving communicationrelated to their need for information. While technology has reduced the distance between library services and students, distance services librarians are charged to remember that not all countries or all distance students are able to access technology with the same degree of ease. Therefore librarians and others are charged to integrate other modalities of communication and service delivery to ensure that all distance students have access to information services for their studies. This is particularly important in developing countries where distance education is a channel to expand educational opportunities but where access to technology is extremely limited to large urban areas and to those who have the economic ability to purchase technological and communication services.

#### Web Technology in Distance Education

The potential for the Internet to revolutionize the field of distance education lies in the comparative simplicity of the tools available; the ease of document authoring; low cost compared to satellite technologies; the decreasing trend away from mainframe servers towards powerful desktop computers; and the theoretical possibility for anyone to utilize it anywhere. While some users are attempting to run completely Internet-based distance education programs, most of those involved are using the Web to supplement classroom instruction. Library services refer to facilities, which are provided by a library for the use of books and dissemination of information for the need and meet the users' requirement. The well known existing library services are cataloguing, classification, circulation services, reservation, renewal, new arrivals, current contents, current awareness service, selective dissemination of information, indexing and abstracting, reference service, document delivery, interlibrary loan, externally purchased database, CD-ROM databases, access to other library catalogues, access to online databases, internally published newsletter, reports and journals, bibliographic services, and so on. All these services have changed its mode to an extent with web environment.

Web-based library services that are modified versions of existing services and technology driven library services or transformed from traditional library services incorporating new services that are peculiar to web environment and underlines its significance for changes in the library information systems paradigms. There are several advantages of web-based services they are :

- a. Save the precious time of the user;
- b. Availability of less number of library staff to carry out the library works and services;
- c. Less dependence upon the library staff for getting the required information;
- d. Multifold increase of the cost of books and journals;
- e. Availability of information in different places and also in different formats;
- f. Cut in library budget;

Users today are accustomed to the dynamic and interactive nature of the Web, as well as social networking tools. Many of them use Web tools to find the information they need. It is very imperative for university libraries and librarians to design, develop, enhance, implement, and deliver world class webbased library services, resources, and instructions at the fingertips of library users and devoting resources to strengthen support in the core areas of teaching and research and identify the relevant information and web services based on the user feedback and improve the existing services using web technology as the delivery mode and developing country like India where resources are limited, funds are invariably for the library.

#### Scope of Web Based Services

Library networks offer much potential and new capabilities for sharing information among different library and information centers at local, regional, national and international levels and eliminate the size, distance, and language barriers among users through resource sharing. The inter-library loan can be provided by sending the information through email using the network facilities. On-line ordering and acquisition related activities can be carried out through e-mail Centralization and computerized online public access cataloging service can be provided by networking system. Networking with union catalogs of various items of information is a boon as it avoids duplication in holding to the extent possible.

Reference service can be enhanced by e-mail and the internet through LAN and WAN.

CD-ROM and multimedia service can be provided effectively through networks. Current Awareness service and SDI may be given through networking systems and the users may retrieve references of their interest in a fraction of a second from an online database.

The speed of data communication through networks are very high and one can obtain information within few seconds from any part of the world sitting anywhere.

The internet is a major tool that delivers to the front door of other networks, other services, and other resources. It is a tool providing access to vast quantities of information and it lets to communicate, share resource and share data with people around the world.

#### Web-Based Services for Distance Learners

Libraries have always changed the pace of that change somehow feels faster now than ever before. Academic libraries are quickly becoming the major players in adopting and incorporating Web 2.0 applications into their services compared with other types of libraries. For example, RSS feeds can inform library users about new library activities, while blogs enable the library to aggregate knowledge from users and setting up a subject-based blog provides constructive resources to assist readers with researching and utilizing this technology. Some important web-based services are as follows:

Access to Database

Several publishers today offer web-based, intranet solutions for providing local access to their databases. Journal publishers have also begun to offer similar situation, for example, Elsevier, for an electronic version of their journals. Apart from the externally purchased databases, libraries have their own collection of CD-ROM databases mounted on their CD server/tower. Online database vendor such as Dialog, Lexis-Nexis, ERIC is delivering their database over the internet. So a library which subscribes to this database can now easily access them over The Web.

# Bibliographic and Cataloguing Services

This service can also be prepared from different

databases available on the Web. For example, e-print archives are more productive means of communication for users in different disciplines. Telnet access to a remote computer of different organizations' library catalog is also available. Information on books which are not easily available may be accessed through telnet.

Library of Congress Catalog is a very popular online service LC. Other libraries, which are on the Web, can be easily accessed through telnet services, which help the researchers. Some of the bibliographic services is available online on the Net. Links from the library homepage can be provided to those sites.

# Bulletin Board Services

A bulletin board is a public discussion area where people can post a message without sending them to anyone's e-mail address that can be viewed by anyone who enters the area. On CompuServe, a bulletin board is called a forum. On the Internet, the equivalent areas are called newsgroups. Separate notice board option can be created through e-mail facility and the latest information on the daily news, job opportunities, admission notice, entrance examination, scholarship and fellowships, new courses etc. can be posted and made available for the users though this bulletin board service. It is proposed to provide this facility to display/ view news, announcements etc. with constant updating of information in an electronic bulletin board. The UGC circular can also be put on this board. Several bulletin boards can be made available in the networks for each specific category of user discipline.

#### Current Awareness Services

CAS according to Luhn is an essential function of management to make the members of its organization aware promptly of such new information which will most likely contribute to performing their individual task with the highest possible degree of competence. The long-term purpose of the CAS is to provide a substitution for the circulation of a new journal to the users various electronic current products have been investigated that could partly provide what the circulation of the journal has provided over the years. They also had to be available via the Web in order to allow the ultimate extension of the service to research students located at the distance of the campus. A library can provide this service through e-mail, which is easiest and common procedure. Otherwise, a library can refer or link directly to some location to their WebPages.

# Electronic Selective Dissemination of Information

An electronic SDI service was formulated to deliver current information of interest to users s on their desktop. Through this service, the Interest Profiles (IPs) of users are searched in a batch mode on the latest updates on a monthly basis and the result is emailed to respective members. Thus this service not only functions as a Current Awareness Tool but also influenced the acquisition of information sources as well as usage of other library services like document delivery, resource sharing and acquiring reprints.

#### • E-mail

It is a web-based excellent media and most probably most popular media. And the library professionals use this web medium for various purposes especially for delivering some web based services. The easiest and convenient method to access the web sources is e-mail. When a researcher who registers his name and chose the content pages of some journals of publishers request for sending the content page of the selected journal the publishers take care of sending the content in advance, against the registered individual's e-mail address. This helps as excellent current awareness service to the scientists.

#### Frequently Asked Questions (FAQ)

FAQ stands for Frequently Asked Questions. A compilation of Frequently Asked Questions and their answer is referred to as a FAQ list or FAQ article. FAQs are compilations of information which are the result of certain questions constantly being asked. There are thousands of FAQs on the World Wide Web. AskERIC is an Internet question answering services run by the ERIC Clearinghouse on Information and Technology at Syracuse University, NewYork. Since it began in 1994 it has answered more than 2 million education-related questions from around the world.

#### Internet Subject Gateways

Subject-based Information Gateways are clearing houses to quality assessed Internet resources. This can be contrasted with gateways where resources are arranged according to where they are physically placed or "geographically" like W3 servers or according to what type of resource they are. A number of libraries are involved in the development of internet subject gateways services that aim to help users find high-quality resources of internet subject gateways offer an alternative to the Internet search engines and Web directories. Subject gateways are typically databases of detailed metadata records, which describes Internet resources and offer a hyperlink to the resources. The user can choose to either searches the database by keywords or to browse the resources under the subject heading. For example: "PINAKES" (http://www.hw.ac.uk/libWWW/irn/pinakes/ pinakes.html). INFOMINE (http://infomine.ucr. edu/Main.html), and BUBLLink (http://bubl.ac.uk/ link/) is a famous LIS subject gateway gives BUBL Journals Abstracts, full text, over 200 titles with other various links.

# List Serve

Listserv discussion lists are topic-oriented forums distributed by e-mail, dealing with a side variety of topics, many of which are academic in nature. Once you've subscribed to a listserv discussion list, messages from other subscribers are automatically sent to your electronic mailbox. To subscribe to a listserv discussion group we have to send an e-mail message. The listserv program handles subscription information and distributes messages to and from subscribers. There is variety of listserv programs but they all work essentially the same way.

# • News Clipping Services

News clip service is one of the CAS provided in many libraries in print/ photocopy form. To provide this service, news items from selected newspapers are first marked and then the clippings are pasted on a white sheet. These filed clippings are then circulated among the users. Due to its physical nature, its distribution is limited by the number of copies generated as well as this conventional filing system provide only one index field for the file. The risk of misfiled and unreturned documents is virtually eliminated in an electronic format. The format may be Text or PDF (Portable Document Format). The image may represent as GIF or JEPG file formats.All the document should be copied to the server root and then executed. A homepage for news clips service has been created and through which access to the news clips has been achieved.

# News Group

They are on-line discussion groups on many topics of varied interest. A program called newsreader is required to view and post a message in newsgroups. Unlike mail lists and chats, newsgroups allow readers to choose the topics to discuss. They can be of immense help to professionals and distance learners. The library staff can post messages in the appropriate newsgroup and discuss library -related problems, adoption of new techniques in libraries, etc.

# Newsletter Services

It is very good service to the users, listing available Internet services, sites, new addition, publications, useful like Conference, Workshops, Training and Fellowship programs. A catalog of Internet base information sources is useful assets for all libraries if given at regular intervals through e-mail or they can host it on their website.

• OPAC

The Online Public Access Catalog is one manifestation of the massive changes that are taking place as we plunge into the information age. OPACs are the gateways to information in libraries and provide facilities to browse, search and locate information. OPACs were developed to meet the needs of users in two different ways (1) it meant access to library housekeeping operations especially circulation and (2) to give the library users direct access to the machine-readable bibliographic records. Generally, OPAC is available and accessible via the Internet. They are known as WebPAC or InternetPAC. WebPAC became more simple popular and easy to handle. The library Web site became a more logical gateway to the catalog and other Web-based library resources. An informative home page introduces users to helpful information about the library, its collections, and services. This order of access is a good opportunity to distinguish between the catalog and other electronic indexes and databases.

# Reference Services

The reference service in a library is often defined as direct personal assistance given to its reader for finding information. It is the branch of library services, which includes personal assistance given to in their search for information on various subject areas, irrespective of size and collection of the library. Webbased reference services owe their increasing popularity amongst librarians to the increasing need to extend the reference desk beyond the library's walls. The goal is to meet the demand for easy 24 hours access to electronic reference sources from the office, and even the kitchen table. Almost all academic libraries offer mediated access to the traditional online services much of this searching is done on databases made available either through loading the data on the library's own server or through access to remote reference servers, such as Information Access Company's InfoTrac SearchBank or OCLC's FirstSearch. A search of the web will yield literally hundreds of libraries that have home pages which offer a startling array of services, ranging from book catalog to commercial databases to community information such as events schedules, political minutes, and information of interest to a user public. Many of these services attempt to provide similar levels of service to those found in the library. In fact, most end users and librarians expect that remote access to electronic resources mean these resources must be self-service, from the perspective of offering easy access to the complete content from a wide variety of sources material in electronic form. And all of this available 24 hours a day, seven days a week. An example of reference online - Britannica online http://www.members.eb.com Online Dictionaryhttp://www.dictionary.com, Online maps, and Atlases-http://www.atlapedia.com/index.html, Encyclopaedia-http://www.encyclopedia.com.

# • Usenet

The Usenet is a global electronic bulletin board, of sorts, in which millions of people exchange public information on every conceivable topic. Also called "Netnews", it consists of thousands of newsgroups covering a vast range of topics. The Usenet newsfeed can be read by a variety of newsreader software programs.

# • Un Cover

UnCover is an online periodical article delivery service and a current awareness alerting service. It indexed nearly 18000 English language periodicals in its database and is still growing. Over eight million articles are available through a simple online order system. Five thousand citations are added daily. Articles appear in UnCover at the same time the periodical issue is delivered to your library or local newsstand, which makes uncover the most up-to-date index anywhere. (http://uncweb.carl.org).

#### Web Casting

Webcasting which is another example of Push Technology, is defined as the "Pre-Arranged updating of news, weather or other selected information on an Internet user's desktop through periodic and generally unobtrusive over the WWW". In other words, push technology or webcasting is a method of information delivery across the web that pushes information to the screens of the user's computer. It is a webcasting was introduced by the PointCast Network in 1996. Presently most of the webcasters concentrate on news delivery.

# White Board Environment

In a whiteboard environment, there can be many users connected to discuss on a topic and it is different from the newsgroup in the sense that the computer screen serves as a whiteboard and the user can draw figure using the mouse and post message/ explanation in the comment box that appears simultaneously with the whiteboard for other users to view. It is multi-user Java chat and drawing program and so the systems that are connected must be enabled to download Java applets.

#### Problems in Accessing Web-Based Library Services

There are a number of obstacles to use web-based library services by users. The problem generally includes lack of skilled professionals, inadequate computers access, insufficient time, lack of library orientation, and lack of systems. The major contributory factor is very low bandwidths. It is a problem that affects web-based library services access in many universities in India. Connectivity is the critical technical factor for browsing web-based library services. To improve the present web-based library services and to develop new web-based library services, there is a need to rate the existing services.

# Issues and Challenges

A huge volume of information is generated every minute so it is not possible to collect each and every useful information in different subject disciplines.

No order or rules are imposed on the generation, distribution, access and use of this information; No fully comprehensive record of the different documents is available at the moment; No classification and description framework for storing and retrieving these documents has been commonly accepted and established. Therefore documents of all kind of format type of information and subject can be found.

The librarian should take one more step further instead of just providing access to the internet. He or she should take the responsibility of evaluating the web resource for providing the effective. The librarian should have depth knowledge about the web resources and the search engine, which will give the real power to the reference librarian to answer the queries.

The librarian should create a web directory of the inter-resources so that it can be used or referred to by

a user whenever it is needed for providing the services.

The users of the library should be given a proper training and explanation about the internet and the search option.

#### Suggestions to Strengthen Web-Based Library Services

The following are the major suggestions for improving the web-based library services in university libraries:

- 1. Updating web pages frequently.
- 2. Contentbased book services.
- 3. More hyperlinks to web-based library services.
- 4. Facility to upload content by users.
- 5. Higher bandwidth and wireless connectivity.
- 6. Institutional archives of faculty publications.
- 7. Simplification of administrative procedures to make the better use of web-based services.
- 8. All back volumes of journals should be available online.
- 9. Digital literacy programs and more web-based tutorials for users.
- 10. There is an urgent need to develop dynamic library websites and compatible with web 2.0 technologies include web forms in each webbased library service. Web 2.0 facilitates communication, conversation, information sharing, and collaboration within the online community.
- 11. UGC of India with the help of INFLIBNET formulate the national web standards for university library websites to meet the new challenges of next-generation web-based library and information architecture and set up web content steering committees to strengthen their controls on information.
- 12. Facilitate the RSS feeds, library wikis, instant messaging reference services, weblogs, virtual library tours, web-based library tutorials, floor maps, discussion forums and listservs represent the new ultimate level of power for web-based library services.
- 13. Apply the semantic technologies and ontologies will be the key aspects in the present generation of web users. "Advanced semantic technologies enable computers to reach a higher level of understanding of the meaning of the information being processed. Ontologies try to resolve the problem of ambiguity in natural language and the problems that arise due to the use of

transmission meanings, analogy, comparison or metaphor".

14. Provide multi-language support content to regional and international users.

#### Conclusion

Developments in information and communication technologies (ICT) have a profound impact on every sphere of academic activity. Library and information management is not an exception for this. Web-based library services will become more widespread and sophisticated as the web becomes commonplace throughout the world, and to be successful players in the e-world. Libraries must continue to address the web design and implementation issues. As we actively transfer library services, our central purpose remains the same, to serve and teach users to find, evaluate, and use information effectively. Earlier, card catalog was called as Index to the library now in this electronic age, it is the library web page that is being called as the Index of the Library. Library websites reflect the strengths and weaknesses of the libraries very effectively. They are also the tool through which libraries are trying to reach out to the tech-savvy user. Libraries should make consistent efforts to provide web-based services to their users. The librarians should be expert to hold the hands of the users who are moving towards new communication paradigm shift from face to face human contact to humanmachine interaction, from paper to electronic delivery, from text centered mode to multimedia and from physical presence to virtual presence. Web-based library services is a trend. Libraries are taking full advantages of internet and web facilities. They are remarkable changing their mode of provision of services. Users also very happy by getting the library services through the web. They can save their time and harassment from not getting the information.

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# Comparative Analysis of Open Source Ontology Editors: A Study

# Kaushal Giri\*, Pratibha Gokhale\*\*

# Abstract

Currently computers are changing from single isolated devices to entry points into a worldwide network of information exchange and business transactions. Therefore, support in the exchange of data, information, and knowledge is becoming the key issue in computer technology today. Ontologies provide a shared and common understanding of a domain that can be communicated between people and across application systems. Ontologies will play a major role in supporting information exchange processes in various areas. To build Ontologies, ontology editors play an important role. Ontology editors are software tools that allow the creation and maintenance of ontologies through a graphical user interface. The paper describes comparative analysis of open source ontology editors.

Keywords: Semantic Web; Ontologies; Ontology Editors.

### Introduction

Ontologies were developed in Artificial Intelligence to facilitate knowledge sharing and reuse. Since the beginning of the nineties ontologies have become a popular research topic investigated by several Artificial Intelligence research communities, including Knowledge Engineering, natural language processing, Information retervial and knowledge representation [1]. More recently, the notion of ontology is also becoming widespread in fields such as intelligent information integration, cooperative information systems, information retrieval, electronic commerce, and knowledge management. Currently, ontologies are applied to the World Wide Web creating what is called the semantic web. Originally, the web grew mainly around the language HTML, that provide a standard for structuring documents that was translated by browsers in a canonical way to render documents [2]. On the one hand, it was the

Received on 22.02.2017, Accepted on 04.03.2017

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simplicity of HTML that enabled the fast growth of the WWW. On the other hand, its simplicity seriously hampered more advanced web application in many domains and for many tasks. Still, XML is basically a defined way to provide a serialized syntax for tree structures. Therefore, it is just an important first step in the direction of a semantic web, where application programs have direct access to the semantics of an important additional step has been taken by RDF which defines a syntactical convention and a simple data model for representing machine-processable semantics of data. Therefore Ontologies will play a major role in supporting information exchange processes in various areas.

#### Semantic Web

Semantic Web is the new-generation Web that tries to represent information such that it can be used by machines not just for display purposes, but for automation, integration, and reuse across applications [3]. The Semantic Web is a Web with a meaning. It describes things in a way that computers can understand. It is an extension to the normal Web and is not about links -relationships between things and its properties. It is the efficient way of representing data on the World Wide Web. Tim Berner Lee (Inventor of Web, HTTP, & HTML) says that

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Semantic web will be the next generation of Current Web and the next IT revolution [4].

# Ontology

The term ontology can be defined in many different ways. Ontology is an explicit specification of a set of objects, concepts, and other entities that are presumed to exist in some area of interest and the relationships that hold them. Ontology defines a common vocabulary for researchers who need to share information in a domain. It includes machineinterpretable definitions of basic concepts in the domain and relations among them. It enables the Web for software components can be ideally supported through the use of Semantic Web technologies. This helps in understanding the concepts of the domain as well as helps the machine to interpret the definitions of concepts in the domains and also the relations between them. Ontologies can be broadly divided into two main types: lightweight and heavyweight. Lightweight Ontologies involve taxonomy (or class hierarchy) that contains classes, subclasses, attributes and values. Heavy weight Ontologies model domains in a deeper way and include axioms and constraints [5].

#### Why to Develop Ontology?

Some of the Reasons are

- To share common understanding of the structure of information among people or software agents.
- To enable reuse of domain knowledge.
- To make domain assumptions explicit.
- To separate domain knowledge from the operational knowledge.
- To analyze domain knowledge.

#### **Ontology Editors**

An ontology editor provides a graphical user interface (GUI) abstraction over various operations involved in ontology creation. A user can create a class and its sub-classes; add properties and relationships; create instances; and specify rules etc. The generated ontology can then be exported into different ontology languages (SHOE, RDF, DAML and OWL etc.) without letting the user to worry about the intricate details of ontology languages. Most of the research proposals adopt their own techniques and criteria for evaluation of their advocated editors. This paper qualitatively evaluated the ontology editors based on certain features. Many ontology editors could be found on Internet. Some of them (like: Apollo, OntoStudio, Protégé, Swoop and Top Braid Composer Free Edition, Comparison could be done by using different criterions: generality, expressiveness, complexity, documentation, scalability etc. In this paper the main criterion is easiness to use and spreading of editors [6].

# **Ontology Editor's Development Tools**

This paper gives a broad overview of some available editors and environments that can be used for the building of ontologies. Comparison could be done by considering different properties of editors. The following are the characteristics [7].

- *General description of the tools:* This includes information about developers and availability.
- Software architecture and tool evolution: This includes information about the tool architecture (standalone, client/server, n-tier application).
- Interoperability with other ontology development tools and languages: This includes information about the interoperability of the tool. Tool's interoperability with other ontology tools can be recognized by functionalities like (merging, annotation, storage, inference, etc.), in addition to translations to and from ontology languages.
- *Usability:* The existence of the graphical editors for the creation of concept taxonomies and relations.

The following editors have been selected for comparison:

- Apollo;
- OntoStudio;
- Protégé;
- Swoop and
- TopBraid Composer (Free Edition).

All these tools are widespread in the ontology design and development sector and are accepted by relatively large semantic web communities. These tools also provide the minimum necessary functionality supporting the ontology development process. The ontology editors are tools that allow users to visually manipulate, inspect, browse, code ontologies, support the ontology development and maintenance task.

# Apollo

Apollo is a user friendly knowledge modeling application. Apollo allows a user to model ontology

with basic primitives, such as classes, instances, functions, relations and so on. The internal model is a frame system based on the OKBC protocol. The knowledge base of Apollo consists of a hierarchical organization of ontologies. Each ontology is the default ontology, which includes all primitive classes. Each class can create a number of instances, and an instance inherits all slots of the class. Each slot consists of a set of facets.(Apollo) Apollo does not support graph view, web, information extraction and multi-user capabilities or collaborative processing but it features strong (files only) and import/export format (I/O plug-in architecture-export plug-ins to CLOS and OCML). Apollo is implemented in Java and it is available for a download from http:// apollo.open.ac.uk/index.html

#### Onto Studio

OntoStudio is the most widespread modeling environment for creating and maintaining ontologies. It stands out due to its comprehensive functions in intuitive ontology modeling. OntoStudio is also able to import many structures, schemas and models. OntoStudio is based on IBM Eclipse framework. It can be downloaded for one month free from http:// www.semafora-systems.com/en/products/ ontostudio/. It is an Ontology Engineering Environment supporting the development and maintenance of ontologies by using graphical means. It is based on client/server architecture, where ontologies are managed in a central server and various clients can access and modify these ontologies. It supports multilingual development, and the knowledge model is related to frame-based languages. OntoStudio is based on an open plug-in structure. The internal representation data model can be exported to DAML+OIL, F-Logic, RDF(S), and OXML. Additionally, ontologies can be exported to relational databases via JDBC.

#### Protégé

Protégé is a free, open-source platform that provides a growing user community with a suite of tools to construct domain models and knowledgebase applications with ontologies. It implements a rich set of knowledge-modeling structures and action that support the creation, visualization and manipulation of ontologies in various representation formats. It can be customized to provide domainfriendly support for creating knowledge models and entering data. Also, it can be extended by a plug-in architecture and Java based application programming interface (API) for building knowledge-base tools and applications. The significant advantage of Protégé is its scalability and extensibility. Protégé (Escórcio &Cardoso, 2007) allows to build and to process large ontologies in an efficient manner. Protégé is freely available for download from http://protege.stanford.edu/

# Swoop

Swoop is an open-source, Web based OWL ontology editor and browser. Swoop (Kapoor & Sharma, 2010) contains OWL validation and offers various OWL presentation syntax views. It has reasoning (RDFS-like and Pallet) support (OWL Inference Engine), and provides a Multiple Ontology environment, by which entities and relationships across various ontologies can be compared, edited and merged seamlessly. Navigation could be simple and easy due to the hyperlinked capabilities in the interface of Swoop. Swoop does not follow a methodology for ontology construction. The users can reuse external ontological data either by simply linking to the external entity, or by importing the entire external ontology. It is not possible to do partial imports of OWL, but it is possible to search concepts across multiple ontologies. Swoop uses ontology search algorithms that combine keywords with DLbased constructs to find related concepts in existing ontologies.

# TopBraid Composer Free Edition

TopBraid Composer comes in three editions: Free Edition (FE) is an introductory version with only a core set of features. Standard Edition (SE) includes all features of FE plus graphical viewers, import facilities, advanced refactoring support and much more. Maestro Edition (ME) includes all features of SE plus support for TopBraid Live, EVN and Ensemble as well as SPARQL Motion and many other power user features.

Top Braid Composer (FE) a component of Top Braid Suite is a professional development tool for semantic models (ontologies). It is based on the Eclipse platform and the Jena API. It is a complete editor for RDF(S) and OWL models, as well as a platform for other RDF-based components and services. TopBraid Composer (FE) can (Knublauch, 2009) loads and save any OWL2 file in formats such as RDF/XML or Turtle. TopBraid Composer (FE) (W3C, 2001) supports various reasoning and consistency checking mechanisms. It also supports the SPARQL inference Notation (SPIN). TopBraid Composer (FE) can download and evaluate the full version for a 30 days evaluation period.

specified in alphabetical order: Apollo, OntoStudio, Protégé, Swoop and TopBraid Composer (FE).

# **Comparison of Ontology Editors (tools)**

The comments concerning this section are based on tools that have been described above. The tools are

#### • *General Description of the Tools*

Table 1: It includes information about developers and availability.

Feature	Apollo	OntoEdit	Protégé	Swoop	TopBraid Compser
Developers	KMI (Open	Ontoprise	SMI (Stanford	MND (University	TopQuadrant
	University)		University)	of Maryland)	
Availability	Open Source	Software license (One	Open Source	Open Source	Software licence (One
		Month free Trail			Month free Trail
		period)			period)

Software Architecture and Tool Evolution

Table 2: It includes information about the necessary platforms to use the tool

Feature	Apollo	OntoEdit	Protégé	Swoop	TopBraid Composer
Semantic Web architecture Extensibility	Standalone Plug-ins	Eclipse client / server Plug-ins	Standalone and client- server Plug-ins	Web- based and client server Plug-ins	Standalone Eclipse plug-in Plug-ins
Backup management	No	No	No	No	Yes
Ontology Storage	Files	DBMS	Files and DBMD	As HTML models	DBMS

#### Interoperability

Table 3: It includes information about the tools interoperability with other ontology development tools.

Feature	Apollo	OntoEdit	Protégé	Swoop	TopBraid Composer
With Other Ontology Tool	No	OntoAnnotate, OntoBroker, OntoMat	PROMPT, OKBC, Jess, FaCT, and Jena	No	Seasame, Jena and AllegroGraph
Imports from	Apollo Meta	XML, OWL, Excel, RDF	XML, OWL, HTML,	OWL,	RDFa, WOL, XML,
Languages	language	(S), UML 3.0, Databases	RDF, UML, XML,	XML, RDF	RDF, UML, RDB and
		Schemas (Oracle, MS-	backend text file, RDF	and text	D2Rq, SPIN, Oracle
		SQL)	file, Excel Bio Portal and	formats	Database
			Data master		
Export from	OCML and	OWL, RDF, RIF,	XML, OWL, HTML,	RDF, OIL	HTML, UML, XSD,
languages	CLOS	SPARQL, F- logic and excel	RDF, UML, XML, Java, F- logic, SWRL	and DAML	Excel, RDB, RDF file.

• Usability

Table 4: It is related to Graphical editors, collaborative working and the provision of reusable ontology libraries.

Feature	Apollo	OntoEdit	Protégé	Swoop	TopBraid Composer
Graphical Taxonomy	No	Yes	Yes	Yes	Yes
Graphical Prunes (Views)	No	Yes	Yes	No	Yes
Collaborative working	No	Yes	Yes	Yes	Yes
Ontology libraries	Yes	Yes	Yes	No	Yes

To sum up, the Apollo, Protégé and Swoop tools are open source ontology editiors and OntoStudio and TopBraid composer (FE) they are available for free trial version but software license is must. The tools: Protégé, TopBraid Composer (FE) and OntoStudio use databases for storing ontologies. The same applies to backup management functionality, which is just provided by TopBraid Composer (FE). Protégé and OntoStudio are more graphical ontology tools. The Swoop is Web-based application. OntoStudio gives support to the Onto Knowledge methodology. TopBraid Composer (FE) uses the

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Exception Handling. Some of the tools only support the joint edition of the functions of browsing. Protégé, TopBraid Composer (FE), Swoop and OntoStudio editors provide documentation ontology, ontology import / export to different formats, graphical view of ontologies, ontology libraries and attached inference engines and Apollo supports Apollo meta language. It is quite clear that Ontology development is mainly an ad-hoc approach. Among several viable alternatives, a user needs to find which one would work better for the projected task and which one easily and effectively can be maintained and expressed. The foundation of ontology is logic, but in same time it is a model of reality and the concepts in the ontology must reflect this reality. The above study has described a tool-assisted method for building the basis for ontologies adopted from domain analysis. After analysing the researcher found protégé as the best Ontology editor.

#### Conclusion

Ontology represents information in a manner so that this information can also be used by machines not only for displaying, but also for automating, integrating, and reusing the same information across various applications. There is lot of work going on to adapt the technology and build ontologies. In near future the above ontology editiors will come out with new and existing features which will help the developers/researchers to build ontologies in a better manner.

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# Contribution of Web Tools in Library Service

# Jayamala Patil\*, Rakesh Khare\*\*

# Abstract

There has been the major change in concepts and practices of using library services since last decade. The combination is made of different ideas and services to energize the user. The libraries are well being adapting the emerging technologies for the integration of contents and to provide best advance services. Thirst for knowledge is the inspiring feature of human beings which is fulfilled by library. If proper nourishment is not provided to mind, it get diverted towards negative, destructive and violent activities. Thus libraries are axis point of wisdom world and have their own identity. It is the strongest medium for transforming education and developing awareness in human beings. Especially in academic Organizations it is the center of attraction for all knowledge gainers as well as knowledge imparters or creators. Social Networking is like a blanket of atmosphere, which has covered the human beings in its pressure and has affected their life style. With the use of ICT tools like Social Networking, librarians have reached out globally and providing services 24 by 7 a day. Librarians are now information facilitator's intersection between the new Technologies, Users and Services. Web tools can be explained in terms of three F's Fast, Find and Friendlyused for three E's Effective, Evaluate and Engage. Web 3.0 is third generation of web design that facilitates communication, secure information sharing, interoperability, and collaboration on the World Wide Web using RSS, Tags, Bookmarks, wikis etc. While third generation tools i.e. web 3.0 are intelligent and mobile. Social networking sites and Web 3.0 tools have found to be very useful to professionals in the Library development. Library and Information Professionals (LIP's) and other professionals are embracing these tools for professional and personal development. Social networking and web 3.0 tools fulfill all the five laws of Library Science. This article reports on research that attempted to find out how the web 3.0 tools have contributed to enhance library services.

**Keywords**: ICT; Web 4.0; Web Tools; Library 3.0; RSS; LIP's; Pod Casting; Mash up; IM (Instant Messaging); Android; iSO.

## Introduction

Information Highways are widely considered as the next generation of high speed communication systems. Heraclitus, a Greek philosopher, quoted as saying "change is the only constant in life." This

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Received on 22.06.2017, Accepted on 28.06.2017

saying has also been translated to "the only constant is change." Changing from traditional libraries to digital libraries now known as resource learning centers. And to share information now libraries have to cuddle the Information and communication technological changes. Although we are not born in digital era but we can establish and create digital environment by providing innovative services and set digital domain. Due to information surpluses and every new wave of Information and communication technology becomes the biggest challenge for libraries to satisfy its users'. Using digital smart tools in library services opens gateway to the users to get required information in minimum time. In sharing of knowledge libraries play a vital role where everyone gains something for themselves as libraries are the center of dissemination of knowledge and always

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proved as facilitator and provider for information seekers. The days are gone when preservation or storing of information was main objective of libraries. Now libraries are not limited in boundaries due to influence of ICT and are no longer with image of rows of books on shelves and newspaper lying on the table. Stereotype library has changed its image into virtual library or e library. Paperless resources called E resources like e Books, e journals have replaced the books and the bookshelves with CD's, DVD's etc. and reading tables and reading rooms have changed to laptops, Chat rooms, and social networking. The traditional ways of human interaction in the society has changed and are influenced by web tools. ICT (Information and communication technology) tools has influenced the paper work in such a way that in coming years, paperwork will be out of fashion and everything will be online.

But when libraries entered in digital form it is important to evaluate the services rendered to users and to study their satisfaction level which will make effective improvement to develop ICT plan and improve ICT infrastructure and software in the library. ICT change the way we work but half measures don't work so use of ICT must be with right tools

Web technologies are user-centered and recently widely spread providing collaborative, interactive and communicative infrastructures and services for the creation and consumption of content and Collaborative tagging.

When social networking and web 3.0 related to library, no user wants to visit the library and search the information for hours in the books. Every user needs the ready and instant information without physical labour. Web tools has put its impact on libraries and changed the libraries to cyber.

According to Wikipedia, "Social media are primarily Internet-based tools for sharing and discussing information among human beings. It is because of its concepts that have led to the development and evolution of web-based communities, hosted services, and applications; such as social-networking sites, video-sharing sites, wikis, blogs, and folksonomies, RSS, podcasts and IM (Instant messaging), and Android mobiles and lot many free as well as paid Apps.

Web 3.0 can easily be defined as an intelligent web portability and mobility. Here information is searched, filtered, personalized and shared. It is a social network where people can contribute their knowledge along with consummation of knowledge and information. Social networking is the sets of networks that follow our fundamental right of "Right to freedom of speech and expression, assembly, association or union, movement, residence, and right to practice any profession or occupation (some of these rights are subject to security of the State, friendly relations with foreign countries, public order, decency or morality). It is a place where we can read and write and share.

Social Networking is the linkage and use of web 2.0 and 3.0 tools to think in new direction for quick and quality services, the exchange of information resources and resource sharing. It is a mode of operation, whereby a number of participants having the same objectives in mind shares information resources. The ultimate aim of networking is to achieve maximum results with minimum input.

#### WEB 3.0 and Library 3.0 Relation

Inventor of the Web, Sir Tim Berners-Lee described web 3.0:People keep asking what Web 3.0 is. I think maybe when you've got an overlay of scalable vector graphics – everything rippling and folding and looking misty – on Web 2.0 and access to a semantic Web integrated across a huge space of data, you'll have access to an unbelievable data resource...

- Tim Berners-Lee, 2006

Web 3.0 are the tools which have given a new way to improve the Library services and to store the maximum knowledge in minimum space. It is a kind of software, which allows publishing, classifying, sharing and explaining the multimedia data in digital form.

When these third-generation tools related with Library for its improvement for better services are termed as Library 3.0.

#### WEB 3.0 Tools

#### Social Networking Sites

Facebook, Twitter, Pinterest, Google Plus+, Tumblr, VK, Flickr, Vine,linkined, Folkdirect, Googlebuz, Hi5, Myspace, Classmates, meetme etc.

These sites allow the users to link with friends' and community users of same profession to share the new thoughts what's new in the virtual society."A collaborative medium, a place where we all [could] meet, read and write" called"Read/Write Web".

- a. For Education: Academia.edu Research gat teach streat .term wiki,
- b. For Books: Anobii, Goodreads, Library thing,

Shelfari, Wattpad, Weread,

- c. Indian Social Networking Sites: BIGADDA
- d. General Sites: Facebook, Twitter, Myspace, Qzone, faceparty(UK)
- e. Photo Blogging: Photolog, My opera
- *f.* Frappr is a bit of a blended network, using maps, chat rooms, and pictures to connect individuals.
  - Whatsup

WhatsApp is another instant-messaging-focused social network

#### LinkedIn

LinkedIn is a social network for professionals. It is globally available in 20 different languages and is used by the recruiting professionals for hiring the right candidates.

#### • Wikkis (Wikipedia)

Wikkis are collective works of authors which allow anyone to edit and modify the content.

#### Blogs

Google, Travel blogs, personal blogs, Fasion blogs, Popular blogs U Tube, Love Blogs, Windows, Livespaces, Blogspot.Com

Photo Sharing Sites

Photobucket, snapfish, Picasa, Web Album, Flicker, Webshots, Social times, fotolog, path etc these sites allow to post picture of various activities related to profession family, friends, social, political involvement and functions

Podcasting and Bodcasting

Audio Video Post cast Directory Podcas Lee, Podo.Com, IPoder.Org, Digital Podcast, Podcast Directory.Com, UTube, Sharing of sites/Streaming, Format and Downloading.

• RSS

RSS Security, create RSS, RSS Tutorials, RSS Software, Yahoo RSS. Through RSS it is possible to distribute up to date web content from one web sites to thousands of web sites around the world. RSS Aggregator Installed in a library system helps the users to have customize personal information.

InternetWeb Services

A Web service is a method of communication

between two electronic devices over a network which gives instant result. Instant Messaging IM, Yahoo, Rediffbol, MSN, Chatroom, Folksonomies, Tagging, Cloud tag.

• *iTunes* 

iTunes is Web 2.0 tool Where you organize, listen, watch, and play. It can easily browse your entire media collection and organize it in the way you like. And when you want to hear or watch something, it's just a click away. Finally, you can buy individual songs instead of having to buy whole albums.

• Papyrus

It is a open source tool for graphical UML. It offers streamline and organized management of staff members on intranet. Easily share and collect documents, notes, online forms and much more.

• Stencyl

Stencyl helps to create Flash games in a flash with or without coding.

Flook

Find and share local secrets. A brand new iPhone application that discover and share the world around you by simply swiping through a stream of nearby flook cards.

• Dapsem

This platform allowing people to show their appreciation to their friends (and soon other stuff), offline and online.

Magisto

It simply makes your video worth sharing it will make a long video to great-looking clip you would be proud to share in few clicks.

• BO.LT

It is a page sharing net work and remix the pages and share with your friends

• Skindler

Skindlers a new narrative for people to work together more effectively over the web.

Simplybook.ME

A Simple to setup web booking application that

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can also be easily installed on company face book fan pages where fans can directly make their appointment bookings.

# • BRE.AD

Bre.ad allows you to customize your own digital billboard to recommend anything you want. Some bakers choose to Promote their personal brand; other like to recommend their favorite things.

Readings

Readings, an on line community built exclusively for people who care about news, videos and want to stay up-to -date. It lets you read and watch your desired news, reviews, videos, etc. In a clean UI.

# • Recipefy

Recipefy is an easy to use recipe manager to create and share your cook book online. Organize recipes by tag, share it with your friends and book mark your favorite one from people around the world.

#### Mashup

A Site should allow the users to access the third party data using API(Application Programmer Interface) and Increase the value of site users" it is a merging of to or more software tools for the enrichment of web users. Mashup mixes content from independent sources to create something new. In simple way it is addition of some thing from one and something from other to get new taste.

#### Flickr

A site for viewing and sharing photographic images.

#### • Slide Share

A site for viewing and sharing PowerPoint presentations, Word documents, or Adobe PDF Portfolios.

# • YouTube

A site for viewing and sharing online videos.

#### Important Mashup

20.1 Library Thing-Site for Book Lover which helps to create Quality Cataloge of books. Library thing Connect people based on books they share.

20.2 Book Price (.net)- Provide quick way to compare the prices of any in print book. This sites collects the prices of different on line book store.

20.3 Book finder 4 U.com- It is a free service that search more than 200 Books store & 90000 booksellers worldwide to find the lowest book price at a click. Goal is simple to provide a book with price comparison service.

20.4 Journal junkje.com-It is a free service for medical practitioners providing latest medical news, Summaries etc.

20.5 Libwarm.com-Site for Library Professionals It Collects updates from RSS Feeds.

20.6 Book jetly.com-It is Social Site that connects with several Libraries sites& Checks books availability in libraries.

20.7 XISBN (Worldcat.org/offilate/web services/ xisbn/app.jsp)

Now all these are available on mobiles called Android cell with n number of Apps which are paid as well as free to install. Due to mobile technology everything has become available at anytime anywhere in pocket and on finger tips. This is all the Third generation Web Tools 3.0. and when used in library are library 3.0.

Web 4.0 Tools: According to Burrus, Web 4.0 is about "the ultra-intelligent electronic agent". It is readwrite-execution-concurrency web with intelligent interactions. Still no exact definition is available. It is also called symbiotic web in which human mind and machines can interact in interdependence. It gives transparency, authority, sharing, partnership and association in communities. It makes job simple more searchable and customized.

But library 4.0 has not been more written and implemented. It can be said that library 4.0 is more intelligent and logical, Open source, Big Data and based on Cloud service. May be devices recognize you by voice, face etc.

# Use of Web 3.0 Tools in Library Services

#### Social Networking Sites for Libraries

Users can create accounts with the library network, see common information needs, recommend resources to one another, and through network recommends resources to users, based on similar profiles, demographics, view previously -accessed sources.

Web 4.0 & 3.0 Tools/Library 4.0 &3.0 tools	Library 3.0 applications	Cases
Open Source	Koha, Dspace Green stone     software	IIT Kharagpur library (http://www.library.iitkgp.ernet.in) IIM Kozekodehttp://dspace.iimk.ac.in
<b>RSS</b> (really simple syndication)	<ul> <li>Announcing arrival of new books, journal and databases</li> </ul>	New York University Library(http://library.nyu.edu/feeds) using feed for providing more general to specific
	• Promote event organized by library and institution.	News: about library hour, new event New Arrivals of Library Recent Acquisition New Announcing, by Library
	• Display important Notices/ Orders rules and regulations as well as guidelines.	ConcordicUniversity Library, Canada (portal@concordia.ca)
Wikkis	Training Tool	Liblink: providing tips for better use of library Ohio Uni.LibraryBizWiki
	Library website	(http://www.library.ohiou.edu/subjects/bizwiki/index.ph p/Main Page) is a ollection of business Reviews of reference
	<ul><li>Subject guide</li><li>Library suggestion</li></ul>	sources databases, books websites etc. http://www.seedwiki.com/wiki/butler-wikiref Wiki used a Subject Guide at Ohio
	Wiki Reference lists	University http://www.library.ohiiou.edu/subjects/bizwia/index.php
		/Main-Page Information resources of Ohio state university library. Its contain article, reference book, business website and other research guide. They have also provided service for online chat through Library Services Electronic Resources Wiki (http://library.hud.ac.uk/wiki/Main_Page) Wellesley College Library
Blogs	Support Library instruction	Blog provided link to valuable information pertaining to
	<ul> <li>Stati Confiduration</li> <li>Subject Resources</li> <li>Course Materials</li> <li>Breaking News</li> </ul>	regarding exam schedule, changes in library timing, link to new resources, education CD and video.
	<ul> <li>To Highlight Library Services</li> <li>To Highlight New Reading Material</li> </ul>	
Photo Sharing	<ul> <li>Encourage reedback from their Patrons</li> <li>Event: annual</li> <li>symposium, Library</li> <li>Function, Book Sale</li> <li>Regular occurrence, tour references,</li> </ul>	Wisblawg-From the UW Law Library University of wisconsin law school Library Alliant International University(SMS to 707-968-7542) American University Library( DC) -Uses Google Voice(Send SMS to 571-766-6349
	transaction, computer use, classroom scene	Arizona State University Library
	<ul><li>Library poster</li><li>To Show the Library activity through photo sharing websites</li></ul>	(http://www.flickr.com/photos/asulibraries/ sets/72157601621243043/) has two type of collection ASU Libraries events(event organized by ASU libraries)and about ASU Libraries.
		American Library Association http://www.flickr.com/photos/ala_members/ala_member s/) (customer.services@uwe.ac.uk)
IM Messenger	Virtual reference	National Library of Australia Canberra, ACT 2600 Australia. (http://www.iprelay.com.au//call/index.aspx) American University Library
(Chat Reference)	<ul> <li>Research Assistant</li> <li>On line references SMS &amp; Video reference</li> </ul>	(http://www.library.american.edu/ask/im.html) using virtual reference service for providing on line reference for researchQuestions from student and faculty.
Social	• As web portal	KendriyaVidyalayaPattron Thiruvananthapuram, kerala,
Software	<ul> <li>For Library Promotion new arrivals of Books, Journals etc</li> </ul>	India (http://www.Libzine.wordpress.com

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	•	New Events, NewWritings, Articles	Arapahoe Library District: http://www.myspace.com/arapahoelibrary
	•	E-mail Alerts.	The Brooklyn College Library: http://www.myspace.com/brooklyncollegelibrary
	•	Institution Notices/ Circular	The Denver Public Library:
	•	Holidays List	http://myspace.com/denver_evolver
	•	Library Rules and Membership Procedures.	Lancaster Library (UK): http://www.myspace.com/getitloudinlibraries
	•	Extension of Library website	The Steele Creek Library: http://myspace.com/steelecreeklibrary
	•	Catalogue , database search	The Stoneham Public Library: http://www.myspace.com/stonehamlibrary
MASHUPS		To share the digital content Library OPAC Visualizing Your Bookshelf	Hennepin County Library: http://www.myspace.com/hennepincountylibrary National Library of Scotland Flickr page http://www.smartplanet.com/blog/pure-genius/social- networking-and-a-free-library-for-science-buffs/2416 Syracuse University Library(http://www.facebook.com/group.php?gid=238033 3929) has a Profile in face book. This was designed to connect student with Library in L2 way. Library provided link to library catalogue for book, database search, chat reference and changing library Schedule. LazyLibrary - it looks at Amazon but it could look at a library catalog.
		visualizing four booksich	LibraryThing API includes Common Knowledge, a Library Thing technology that lets you contribute interesting facts and data about books, authors, editions, and other items within the Library Thing univers
			Branch Locations, Cambridge Public Library, Cambridge,

#### Conclusion

The study results that use of web tools applications in Library enhance user experience and interest. Social Networking and Web tools Applications when implemented in library it results in three F's by finding the information effectively, fast service and friendly with users. Use of web Technology in Libraries have developed the library service at par resulting in three E's Effective services, Evaluation of services and Engagine the reader with updated informations. In coming decade these ICT web tools will no doubt change the traditional libraries into virtual library. Use of Internet tools in library made the information easily available, inter linked, inter changeable and inter disciplinary. Librarian has to accept the challenge of new generation web tools and make himself fully acquainted with the technologies. Library and information professionals and other professionals are embracing these tools for Professional and personal development. Social Networking is the linkage and use of web 3.0 tools to think in new direction for quick and quality services, for exchanging of information resources and resource sharing. The ultimate aim of networking is to achieve maximum results in minimum time. The best conception of library 3.0 at this point in time would be a social network interface that the user designs. It is a Personalized OPAC that includes access to IM, RSS feeds, blogs, wikkis,tags,and public and private profiles within not only in the library's network but also on mobiles.

Ontario. Library Addresses + Google

Library 3.0 is not about searching but findings not about access. Sharing Library 3.0 recognizes that human beings do not seek and utilize information as individuals but as communities. Library and information professionals and others in their workplaces are responding to the increasing importance and visibility of web tools and social networks at work. At last social networking has become basic need of Information Centers.

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# Citation Errors in Scholarly Communication: A Critical Evaluation

#### Vishnu Kumar Gupta

#### Abstract

An ideal reference list is made up of reliable references, which are used and consulted during the research study, and is an inseparable part of a scholarly communication. Omissions and mistakenly transcriptions of various elements of citation in reference lists, viz. names of author(s) and/or editor(s), book title, journal title, article's name, volume number, year, pagination etc. can cause serious bibliographical problems, and such errors often exists in published reports, indexing and abstracting sources for a long time. The paper highlights the challenging key issues related to citation errors, peer review process and impact of peer review on citation errors. Possible solutions are also provided for maintaining the top level accuracy in citations.

Keywords: Citation Error; Reference Accuracy; Peer Review; Scholarly Communication.

#### Introduction

Citation is a quotation of or explicit reference to an information source for substantiation, especially used in a scholarly communication. According to online version of Collins English dictionary, meanings of citation includes, "citing of an author or book in support of a fact, a passage or source cited for this purpose, a listing or recounting, as of facts [1]." Macmillan English dictionary (2002) defines citation as, "a phrase or sentence taken from a piece of writing or speech, the process of citing something or of being cited" (p. 243) [2]. In general, the terms "reference" and "citation" are used synonymously and interchangeably. A bibliographical reference is defined by British Standards BS1629: 1976 and BS5605: 1990 as "a set of data or elements describing a document, or part of a document, and sufficiently precise and detailed to enable a potential reader to identify and locate it [3,4]." In simple words, a citation

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Received on 30.04.2017, Accepted on 09.05.2017

is a reference to a document or information source, which may be either published or unpublished, and it may be a primary, secondary or tertiary source of information. Generally, bibliographies, and similar lists, such as compilations of references, are not allowed to take place of citations because these bibliographies do not satisfy the real objective of the citations, that is, "deliberate acknowledgement by other authors of the priority of one's ideas [5]."

Citations, according to the opinion of Blaise Cronin (1984), are "frozen footprints in the landscape of scholarly achievement...which bear witness to the passage of ideas [6]." A citation is a medium of giving credit to persons for their creative works and intellectual ideas that are used to support in the research work. It may also be utilized to search specific information sources and fight against plagiarism. Normally, a citation may contain the author's name, editor's name, journal title, book title, chapter of a book, publication date, place of the publication, and/ or Digital Object Identifier (DOI).

A perfect reference list is made up of reliable references, which are used and consulted during the research study, and is an inseparable part of any scholarly communication. Entries in "Reference List" or "Works Cited" are arranged alphabetically by surnames of authors, editors, translators, and/or by initial words of titles. References in an article of scientific journals may be divided into two parts. First

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part is the quotation, which appeared in the text; and second is the citation, which occurred at the end of the article. In the first necessary part, each section of article that is either quoted from, and/or based on an external information source is marked as such with an inline citation. The inline citation can be in the form of a footnote, parenthetical reference, or a shortened version of the citation known as short citation. An inline citation is any citation written and associated near to the words or idea it supports, for instance after the paragraph or sentence, generally a superscripted footnote numeral. The other second part of the reference or citation is the list of all references appeared at the end of the article in a "References" section, which gives full formatted details related to the information source, so that any individual who reads the article can retrieve it and check it. This part is arranged according to a specific order, which may be numerically by superscripted numbers as presented in the text, or alphabetically by surnames of authors, editors, translators, and/or by initial words of titles.

In all sorts of scholarly communications, a reference list is embedded with articles. So sufficient attention of authors, peer reviewers, and journal editors is needed while preparing, reviewing, and editing them for publication, respectively. Both the terms "reference" and "citation" are used synonymously in this article.

#### **Scholarly Communication**

The word "scholarly" is academically used in the field of research and development in higher education. Scholarly communication is often used to express how research findings are shared among academic and scientific community. Borgman (2000) illustrates the concept of scholarly communication as "the study of how scholars in any field (e.g. physical, biological, social and behavioural sciences, humanities and technology) use and disseminate information through formal and informal channels. The study of scholarly communication includes the growth of scholarly information, the relationships among research areas and disciplines, the information needs and uses of individual user groups, and the relationships among formal and informal methods of communication [7]." Scholarly communication, as defined by the Association of College and Research Libraries (ACRL), a division of world's largest and oldest association, the American Library Association (2004), is "the system through which research and other scholarly writings are created, evaluated for quality, disseminated to the scholarly community, and preserved for future use. The system includes both formal means of communication, such as publication in peer-reviewed journals, and informal channels, such as electronic listservs [8]." The primary aims of scholarly communications are to disseminate the research findings to other researchers and academic community, to maintain the quality of research through proper evaluation by journal editors and peer-reviewers, and to conserve knowledge for future generations in both print and electronic media.

Some examples of informal communication are exchange of personal communication, face-to-face discussion, sharing opinions and views etc. These are easy and fast channels of communication. Derek de Solla Price (1963) used the term "invisible college" to explain the "informal communication network [9]." Formal scholarly communication includes research articles in journals, research monographs, theses and dissertations, edited books, conference proceedings, technical reports, letters, memos, and so on. They all are permanent vehicles of knowledge [10].

Formal peer review is useful in making decisions about who should be promoted or hired, who should receive grant money, and which articles should be published. According to Armstrong (1997), most successful scholars and researchers find the journal peer review to be effective, because it decreases the quantity of errors in published work [11].

An articulation of research results is very necessary to enable Government funded R&D institutions, universities, and the other key players to develop a clear policy framework to support cogent scholarly communications as a strong foundation of influential high-impact and high-quality research and knowledge transfer.

#### **Citation Error**

Citation error is defined by Alfred Yankauer (1990) as, "errors of commission or omission in the printing of the reference [12]." In a study on "Citation Errors in Library Literature", Idrisa Pandit (1993) indicates that "errors focus on the citations themselves and exclude the extent to which authors correctly quoted a text or acknowledged an intellectual debt [13]." On the basis of "the ranked list of journals in ISI's Journal Citation Reports and selected studies that have identified core journals", Pandit chose the five library science journals including the Library Trends for analysis (p. 189). She also successfully compared the published references in articles against the original documents. Doms (1989) also defined an accurate, or correct reference as "one in which all included elements are identical to the source [14]."

A century ago in 1916, Frank Place, Jr. has pointed

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out that bibliographical references are frequently "called upon to locate papers" not yet indexed [15]. Foreman and Kirchhoff (1987) stated that references "provide a method of evaluating the article; [and] assist in assessing an author's credibility [16]." Place (1916) critically indicated that many esteemed scholars take "a reference from another's bibliography as though it were thereby Gospel truth itself" (p. 699). In fact, various scholars don't examine the original information sources before citing/quoting them. However, thoroughly checking of all published references with original sources is not possible. Because of the scholars' libraries not having the cited sources, they acquire the cited sources by interlibrary loan facility and/or by any other way [17].

Most probably, the errors in citations and bibliographical references have appeared since the authors have started citing other authors. Generally, omissions and mistakenly transcriptions of various elements of citation in reference lists, viz. names of author(s) and/or editor(s), book title, journal title, article's name, volume number, year, pagination etc. can cause serious bibliographical problems, and such errors often exists in published reports, indexing and abstracting sources for a long time.

The world famous example of such a citation error is the case of Prof. Jaroslav Hlava (1855-1924). In the annual volume 26, no. 5, 29 January 1887, Journal of the Czech Physicians published from Prague, a paper was written by the Dr. Jaroslav Hlava. This widely cited paper originally authored by Prof. Hlava, Czech Professor of Pathological Anatomy at Prague, entitled "O Uplavici" which means "About Dysentery", got incorrectly attributed to a Dr. O. Uplavici [18]. This happened due to translation error from Czech (Bohemian) to German and English language. The author's name was written in small letters, and the translator mistakenly wrote "O Úplavici" (About dysentery in Czech) in place of the author's name and "Predbezna Sdeleni" (Preliminary communication in Czech) for the title "About Dysentery." This mistake was repeated in many forms for more than 50 years until Clifford Dobell wrote about the true fact of this noted atrocity [19-20]. This disgraceful, and also comical, instance of citation error explains the two points. First is, any error in citation happens, albeit paper's writer is a well known scholar. It is a very common phenomenon, existed in scholarly communications. Second, citation error can create problems in scholarly communications, becomes selfperpetuate, and later makes embarrassing situations. As such, miscitations or citation errors not only raise questions and create doubts about the credibility and integrity of the author; they also badly influence both

the validity of the important research outputs and the trustworthiness of the cited documents [21-23].

# Why Citation Error

To err is human. To self-repair fortunately is also. In the publication process of journal articles, citation errors generally appear due to carelessness of authors, peer reviewers, and journal editors. All three are equally responsible for inaccuracies in bibliographical references. First and primary responsibility of an article's author(s) is to make sure that they have not done any mistakes in the final manuscript. Anyhow author(s) should cross check the references with original sources, and make them completely accurate and error free. In any scholarly communication, citation errors occur due to lack of proper proofreading of an article by peer reviewers and editors. But now-a-days, typos and editing errors are common, because editors work on tight deadlines and schedules.

In spite of critical appraisals performed by peer reviewers and journal editors of articles' texts, bibliographical references or citations are often under-evaluated [24]. As such, many lacunas are there in peer review process. For example, this process can be time consuming and slow; misunderstanding or biasing may be showed by the reviewers' side; it cannot be completely sufficient; at all times, it is not successful at detecting inaccuracies, plagiarism or academic theft; and it may be used destructively by opponents and competitors.

Due to variety of reasons, errors in citations can be occurred in scientific writings. So many referencing standards and guidelines are available; some of them are *MLA Referencing Style*, *APA Referencing Style*, *Chicago Manual of Style*, *Turabian Style*, *Harvard Style*, *Vancouver Style*, etc., which are to be followed by researchers while writing articles or any piece of research work. Main reason behind citation errors is that authors fail to follow such standard styles and guidelines.

The key format of reference of various journals is different due to the differences among the various citation standards and styles. If such styles and guidelines are not carefully followed by authors, then errors in references are inevitable. Furthermore, these errors create difficult situations in searching references when needed. Citation errors may be identified to a lack of similarity in citation styles, misunderstanding and misconception of non-native languages, failure to check the information source cited, and normal human inabilities to imitate big strings of information correctly, coupled with a normal lack of practicing the rules of citation styles. The actual difficulty, the failure to trace and rectify citation errors, is due to a scattered onus in the publishing cycle of scholarly communication.

#### Categories of Citation Errors

Citation errors are generally categorized in two classes, viz. major errors and minor errors. Various types of errors in bibliographical references are found or detected by many authorities. For an article of a journal reference, some of them are misspelt authors' name, article's name, journal's title, incorrect volume and issue number, wrong year of publication, and page number in reference list. Similarly for book reference, errors may be in author's name, editor's name, title of book, name of author of book chapter, publication place, publishers, page numbers, and year of publication.

A major error "prevent immediate identification of the source of the reference [17]." While a minor error in citation does not stop the reader to trace and retrieve the original information source or article without too much inconvenience. Minor errors are, though not serious in articles, includes format errors and punctuation errors. They break the uniformity and consistency of the pattern of references.

Doms (1989) made two broad categories of all references as "correct or incorrect." He defined both of them as "A correct reference was a reference that was identical to the source. An incorrect reference was a reference that deviated from the source [14]." In this analytical study of five peer reviewed dental journals, errors "involved names or initials of authors, title of article, name of journal, volume number, year of publication, page numbers, punctuation, [and] spelling [14]."

Trost and Mulhall (2014) categorized citation errors in three classes, namely, "incorrect errors", "errors of interpretations", and "suboptimal errors." First, "incorrect errors", which includes unrelated references, duplicate reference, unverifiable statement, and wrong reference. Second class "errors of interpretation", which contains discrepant data or conclusions, overstatement/understatement of findings, and third "suboptimal errors" includes inappropriate reference, reference to review article in lieu of source publication, inactive or indirect websites [24].

#### **Impact of Peer Review on Citation Errors**

Peer-review process undoubtedly enhances the quality of an article. Few journal publications, for

example the *Library Trends* and the *Archives of Physical Medicine and Rehabilitation*, have hired review professionals to examine the correctness of bibliographical references in papers that they received for publications. Two such professionals named Key and Roland (1977) checked the references of 129 papers submitted for publication to the *Archives of Physical Medicine and Rehabilitation* and concluded that "54% of the 1,867 references examined were incorrect, and 6% could not be verified [25]." They did not further analyze the same 129 papers after they were published. In citation errors studies, if any cited document that could not be traced by any means, may be classified as "unverifiable [17]."

Pandit (1993) examined 335 references, in which 177 (52.8%) found errors in the manuscript, and only 14 (4.2%) errors were trace after publication. Checking of references by the review staff in the manuscript before final publication indicates that errors in references significantly decreased the quantity of errors [13].

Bradley (1981) conducted an author survey of 361 psychologists and statisticians, and concluded that 260 (72%) authors opined that "The net effect of refereeing upon the quality of the article was to improve it [26]." In another study conducted by MacNealy, Speck & Clements (1994), 72 (80%) of the total 96 scholars responding argued that they felt the peer-reviewers' advised revisions to be "reasonable [27]."

Onwuegbuzie, Frels, and Slate (2010) did a study based on mixed research methods. In this study, they checked 150 manuscripts of articles submitted to the journal *Research in the Schools*. These manuscripts counted about 60% of all article's manuscripts submitted to this journal over the period of 7 years, from 2003 to 2010, which made their results generalizable to the population of manuscripts submitted to the journal *Research in the Schools* (p. 3). Astonishingly, 91.8%, which is a major part of authors, who submit articles to journal *Research in the Schools* make citation errors [28].

Accuracy is an important criterion of quality measurement. It means the proximity of calculated values, observations, measures to the true value, or to a value which is accepted as being true. Accuracy of bibliographical references is necessary to the success of scholarly communications, citation analysis, bibliometrics studies, interlibrary loan (ILL), document delivery services (DDS), database management, evaluation of an author's work, etc. [13]. Correct references make easier all of these works and activities. Errors in references directly influence the results of bibliometrics and citation studies.

#### **Possible Solutions**

Apart from verifying quotations, accurate citations are essential to avoid plagiarism, and to facilitate readers to trace and consult any original document to follow-up a cited author's arguments. Presently the most used method for disseminating research results to the academic community is through peer reviewed journals. In the peer review process, various subject experts carefully read and advise authors to rectify the article, and also decide if it is of sufficient quality. Authors should never cite a reference that they have not read. Authors should verify all citations just before the submission of final copy of manuscript. Harinarayana along with his team (2011) conducted a study, assessing the citation accuracy in five doctoral dissertations in the field of psychology submitted to the University of Mysore, India and suggested for imparting training for new research scholars to specialize in suitable citation styles and advised Indian universities to take active role in imparting Information Literacy (IL) skills for researchers to maintain the citation accuracy. They found massive error rate in references in psychology theses. Out of total 923 references assessed, only 210 (22.75%) were accurate, while a huge proportion of references 713 (77.25%) contained citation errors [29].

Maintaining the top level accuracy in citations is one of the good qualities of an author. Author(s) should consistently follow only one citation style or method throughout in his article. While author should try to record citations accurately, what matters most is that author(s) give sufficient information to trace and retrieve the original document.

Notwithstanding, journal editors and peerreviewers should not deny their duties and responsibilities regarding accuracy of citations in articles. For instance, they can publish sample references from each paper decided for publications. When any error is traced in the references in article, it could be immediately sent back to authors giving instructions to rectify references again. This procedure may be strengthen by alerting the authors that publication would now be deliberately delayed and that the same process would be applicable if a further inaccuracy was detected in manuscript after resubmission [17]. Journal editors require to make judgement of the peer-reviewers' work to the equal standards that they want and demand from authors and researchers.

A citation, or a reference, uniquely identifies a source of information. Accuracy in citations in research studies are essential for the dissemination of all kinds of knowledge to academia, so it is very important that citations should be jotted down flawlessly to make searching convenient. Accurate citations further help the readers in learning new areas of knowledge. Such readers consult the reference list to get the original information sources for a study earlier proved to be effective. Nothing can be more painful and frustrating for those readers than to discover an unidentifiable reference. In addition, through accurate citations, the quality and credibility of the research studies, the authors, and the journal itself are augmented [30-31]. Indubitably, bibliographic references or citations make a major part of all sorts of scholarly communication. As such, a collective endeavor and sufficient attention is required to eliminate the cyclic process of citation errors and develop an error free citations culture. This culture encompasses many components of academia, viz. higher educational premier institutions, R&D institutions, university-level guides and instructors, members of the research (dissertation/thesis) committee, supervisors/chairs, team members of publication agencies, and journal editors. In a nut shell, care must be taken by all concerned academics at their own level to improve the quality of published articles. Finally, error free citations always prevent creating critical problems for librarians and readers who later on make efforts to identify and retrieve information sources.

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# Conclusion

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#### Article in supplement or special issue

[3] Fleischer W, Reimer K. Povidone iodine antisepsis. State of the art. Dermatology 1997; 195 Suppl 2: 3-9.

#### Corporate (collective) author

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#### Reference from electronic media

[9] National Statistics Online – Trends in suicide by method in England and Wales, 1979-2001. www.statistics.gov.uk/downloads/theme\_health/ HSQ 20.pdf (accessed Jan 24, 2005): 7-18. Only verified references against the original documents should be cited. Authors are responsible for the accuracy and completeness of their references and for correct text citation. The number of reference should be kept limited to 20 in case of major communications and 10 for short communications.

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