ISSN 0972-1975

UGC - CARE enlisted Journal

COLLEGE LIBRARIES

(A Peer-Reviewed Quarterly Journal)

West Bengal College Librarians' Association (WBCLA)

Vol. 38 No. I March, 2023

COLLEGE LIBRARIES

(A Peer-Reviewed Quarterly Journal)

"College Libraries", a peer-reviewed quarterly journal is published since 1983. Previously it was known as "College Librarians". This Journal is being continuously publishing more than 40 years as an organ of West Bengal College Librarians' Association (WBCLA) and new volume bring sout with March issue every year. The articles which have been published in this Journal focused on academic problems and issues germane to college and university libraries as well as all burning issues related to Library and Information Science. "College Libraries" also provides a forum for authors to present research findings and where applicable, their practical applications and significance; analyze policies, practices, issues and trends; speculate about the future of academic Librarianship. We also provide authors benefits, such as, free PDFs, liberal copyright policy, special discount on WBCLA publications and much more. "College Libraries" is indexed in Indian Library Science Abstract (ILSA). For more information visit our website: www.wbcla.org.in

Editorial Correspondence

To
The Editor, 'College Libraries'
West Bengal College Librarians' Association (WBCLA)
Uday Villa, Flat No. "C", Fourth floor
59/1, Harakali Colony, South Dum Dum, Kolkata-700074
E-mail:collegelibraries1983@gmail.com

COLLEGE LIBRARIES

(A Peer-Reviewed Quarterly Journal)

ISSN : 0972-1975 **Vol. 38 No. I** **March - 2023**

Contents

Expectations of NAAC from Libraries as Evident from Different Guidelines and NAAC Peer Team Report of A Grade Colleges of Assam: a descriptive study for better visibility in front of NAAC for the institutions

Dr. Badan Barman

Assistant Professor, Department of Library and Information Science, Gauhati University, Assam

Abstract

The purpose of this study is to review the NAAC AQAR "Guidelines to the Institutions" that include Universities; Autonomous Colleges; Affiliated / Constituent UG Colleges; and Affiliated / Constituent PG Colleges, "Guidelines to Peer Team (Assessors)", "Institutional Accreditation Guidelines to the Peer Team" and "Peer Team Report on Institutional Assessment and Accreditation"of NAAC A Grade Colleges of Assam to find out the expectation of NAAC from the libraries and what are the other metrics where library can represent. It includes the study of all the guidelines of NAAC and the "Peer Team Report on Institutional Assessment and Accreditation" of NAAC A Grade Colleges of Assam page by page and word by word to list all the points/metrics and information sought and evidence required. The study brings to the surface the expectation of NAAC from libraries in the form of a single document by integrating all the points related to the libraries for easy consultation by the librarian and library administrator for NAAC compliance. It also lists the other metrics which are not directly related to the library but can contribute to it for the greater benefit of the institute.

Keywords: Expectation of NAAC from libraries, Libraries of NAAC A grade colleges, NAAC and library, NAAC guideline for libraries, NAAC metrics for libraries

1. Introduction

The National Assessment and Accreditation Council (NAAC) was established in 1994 as an autonomous institution of the University Grants Commission (UGC). It periodically conducts assessment and accreditation of Higher Educational Institutions (HEI) such as colleges, universities or other recognised institutions, to derive an understanding of the quality status of the institution. NAAC evaluates an institution for its conformance to the standards of quality in terms of its performance related to eight criteria and under each criterion a few "Key Indicators" (KIs) are identified. These KIs are further delineated as metrics, which actually elicit responses from the HEIs.

The criterion-wise differential weightages for universities, autonomous colleges, affiliated colleges / constituent colleges (affiliated to universities recognised by UGC) are given below:

Table 1: NAAC assessment criteria and its weightage for institutions

Criterion No.	Criterion Name	Weightage			
		Universities	Autonomous Colleges	Affiliated/ Constituent Colleges	
				Under Graduate	Post Graduate
I	Curricular Aspects	150	150	100	100
II	Teaching-learning and Evaluation	200	300	350	350
III	Research, Innovations and Extension	250	150	110	120
IV	Infrastructure and Learning Resources	100	100	100	100
V	Student Support and Progression	100	100	140	130
VI	Governance, Leadership and Management	100	100	100	100
VII	Institutional Values and Best Practices	100	100	100	100
Total		**1000**	**1000**	**1000**	**1000**

Out of the total scores, about 70% come from the System Generated Scores (SGS) or online evaluation and about 30% comes from peer judgment. The final assessment outcome of the whole exercise is the grading of the institution on Cumulative Grade Point Average (CGPA) of the institution or on an eighth-grade ladder. The ladder, its range and letter grade are mentioned below-

Table 2: NAAC CGPA and its associated grade for institutions

Ladder	Range of Institutional CGPA	Letter Grade	Performance Descriptor
1st Grade	3.51 – 4.00	A++	Accredited
2nd Grade	3.26 – 3.50	A+	Accredited
3rd Grade	3.01 – 3.25	A	Accredited
4th Grade	2.76 – 3.00	B++	Accredited
5th Grade	2.51 – 2.75	B+	Accredited
6th Grade	2.01 – 2.50	B	Accredited
7th Grade	1.51 – 2.00	C	Accredited
8th Grade	⩽ 1.50	D	Not Accredited

A good grade in NAAC is very important to the institution as it is associated with funding besides the reputation of the institution and others.

2. Literature review

The publications of NAAC fall basically into three categories. The first category of document was targeted at institutions, and it provides an outline of the expectations of NAAC from institutes and provides guidelines related to the IQAC compositions, functions, AQAR and SSR preparation, manuals, and different kinds of data templates. The second category of documents was targeted at the assessors (peer team), wherein their functions, activities, and code of conduct were outlined. The third category of documents is general publications targeted to specific subject areas, like libraries, and are basically edited volumes that provide in-depth information regarding all quality indicators of the concerned area.

Mehta, and Vyas, (2021) discussed eight points under criteria 4 Infrastructure and Learning Resources and they are library advisory committee, total area of library, total seating capacity, collection of books (print and electronic), collection of journals (print and electronic), collection of other e-resources which got through the memberships of network or consortia whereas Bordoloi, Rajashree (2021)looked into the compliance of the NAAC assessment team's recommendations by the libraries of NAAC-A graded colleges of Assam. Naveen and Kannappannavar (2020) mentioned eight major areas that can be reduced to six i.e., computerization, internet facility, N-List facility, infrastructural development (including separate library building), collection development (including increase no. of journals) and digital library improvement after NAAC assessment. Jange (2021)went beyond the boundaries and provided some hints where librarians can play

a role in improved NAAC grading in overall institution accreditation. However, all these are viewpoints and are not supported by a strong foundation.

3. Objectives of the study

The study is conducted with the following objectives in mind :

i) to study the expectations of NAAC from the libraries as evident from their different guidelines

ii) to identify and study all other NAAC metrics where libraries contributed to the NAAC A-Grade Colleges of Assam and

iii) to study the expectations of NAAC as evident from the Peer Team Report of NAAC A-Grade colleges.

4. Methodology

A mixed methodology including a mix of descriptive and explorative study is used to achieve the stated objectives. Firstly, a careful study of the NAAC AQAR "Guidelines to the Institutions" (Universities; Autonomous Colleges; Affiliated/Constituent UG Colleges; and Affiliated/Constituent PG Colleges); "Guidelines to Peer Team (Assessors)" and "Institutional Accreditation Guidelines to the Peer Team"for the year 2020-2021 were conducted to find out the expectation of NAAC from the libraries. Secondly, on the website of NAAC (http://218.248.45.212/naac_EC/NAAC_allcycles_accrlist.aspx), "College" is selected under "Select Institute Type" and "Assam" is selected under "Select State" and then made a search to find out the list of colleges which are accredited by NAAC. The website retrieved 204 colleges accredited by NAAC, out of which in a manual search it was found that 22 colleges (10.78%) out of 204 total colleges accredited by NAAC received A Grade.Later on, the "Peer Team Report on Institutional Assessment and Accreditation" of the institute is consulted and all relevant data is tabulated and analysed to derive a conclusion.

5. Expectations of NAAC from libraries as evident from their guidelines

The study reveals that in NAAC guidelines, under the 4th criterion, i.e., "Infrastructure and Learning Resources", "4.2 Library as a Learning Resource",is exclusively meant for the libraries and it has a total weightage of 20 in overall 1000 weightage irrespective of the type of institution, i.e., universities, autonomous colleges, affiliated / constituent Colleges (both undergraduate and postgraduate colleges). Out of the total of 5 metrics, 3 metrics are quantitative and 2 are qualitative in nature and in all metrics, data needs to be supported by evidence. The following are the metric-wise expectations of the NAAC from libraries-

Table 3: Expectations of NAAC from libraries as evident in their different guidelines

Metric No.	Weightage	Type of Data	Required Data in Data Sheet	Information Sought from				Type of Evidence Required
				Universities	Autonomous Colleges	Affiliated / Constituent		
						Under-Graduate Colleges	Post-Graduate Colleges	
4.2.1	4	Qualitative (200 Words)	Not Applicable	Library Automation and Library Digitisation	Name of ILMS, Version, Year of Automation, Level / Nature	Same as that of Autonomous Colleges	Same as that of Autonomous Colleges	Copy of Purchase Details, Bill, Payment Receipt, Audited Accounts
4.2.2	6	Quantitative	Resource Type; Date; Name of the Agency; Expenditure	How Many Category of E-Resources Subscribed out of: E–Journals, E-books, E-ShodhSindhu, Shodhganga, Databases ** Manuscripts and Rare Book *** Library Holding *** Recent Acquisition	How Many Category of E-Resources Subscribed out of: E–Journals, E-books, E-ShodhSindhu, Shodhganga, Databases, Remote Access	Same as that of Autonomous Colleges	Same as that of Autonomous Colleges	Copy of Purchase Details, Bill, Payment Receipt, Agreement, MoU, Audited Accounts
4.2.3	5	Quantitative	Resource Type; Date; Name of the Agency; Expenditure	How Many Books/E-Books; Journals/E–Journals Subscribed	Same as that of Universities	Same as that of Universities	Same as that of Autonomous Colleges	Copy of Purchase Details, Bill, Payment Receipt, Agreement, MoU, Audited Accounts
4.2.4	5	Quantitative	Accession Register; Gate Register; Login Data for Web Resources	Usages Data of Library	Same as that of Universities	Same as that of Universities	Same as that of Universities	Copy of Accession Register; Gate Register; Login Data for Web Resources

(* Means it appeared in "Guidelines to the Institutions";**Means it appeared in the "Guidelines to Peer Team (Assessors)" and *** Means it appeared in "Institutional Accreditation Guidelines to the Peer Team")

a) **Metric 4.2.1 library automation and library digitisation:** It is a qualitative metric and the description within 200 words needs to cover"Name of ILMS", "Version", "Year of Automation", "Level / Nature". In the case of the existence of a digital library, "Name of DL Software", "Version", "Year of Digitisation", "Level / Nature"are expected to be provided.

   Evidence required: Copy of Purchase Details, Bill, Payment Receipt, Audited Accounts

b) **Metric 4.2.2 library collection / holding:** It is a quantitative metric and it needs to cover data in MS Excel that represents "Resource Type" (Manuscripts and Rare Book, E-Journals, E-books, E-ShodhSindhu, Shodhganga, Databases, Remote Access); "Date"; "Name of the Agency"; "Expenditure".

   Evidence required: Copy of Purchase Details, Bill, Payment Receipt, Agreement, MoU, Audited Accounts

   Confusion: People who will consult different types of NAAC manual will find this metric confusing, as for some types of institutes, the recent acquisition needs to be provided in some other of its library holdings, whereas in others it includes the type of e-resources subscribed. Again, there are certain errors in this metric. For example, Shodhganga should not have been under the subscribed resources.

c) **Metric 4.2.3 library collection / holding:** It is a quantitative metric and it needs to cover data in MS Excel that represents "Resource Type" (How Many Books/E-Books; Journals/E-Journals Subscribed); "Date"; "Name of the Agency"; "Expenditure".

   Evidence required: Copy of Purchase Details, Bill, Payment Receipt, Agreement, MoU, Audited Accounts

d) **Metric 4.2.4 library use statistics:** It is a quantitative metric and it needs to cover data in MS Excel that represents "Total No. of Book Accessioned", "No. of Daily User", "No. of Session".

   Evidence required: Copy of Accession Register; Gate Register; Login Data for Web Resources

6. Identification and study of all other NAAC metrics where libraries contributed

The criteria "4.2 Library as a Learning Resource" is exclusively meant for libraries. However, beyond this criterion, the study of "Peer Team Report on Institutional Assessment and Accreditation" of 22 colleges with a NAAC A Grade revealed that the library is also represented in the following metrics.

Table 4: NAAC metrics where libraries also can contribute

Metric No.	Type of Data	Required Data in Data Sheet	Information Sought				Type of Evidence Required
			Universities	Autonomous Colleges	Affiliated / Constituent		
					Under-Graduate Colleges	Post-Graduate Colleges	
2.3.2	Qualitative (200 Words)	Not Applicable	Teachers' use of online resources	Same as that of universities	Same as that of universities	Same as that of universities	Link to online resources
3.1.1	Qualitative (200 Words)	Not Applicable	Institution Research facilities	Same as that of universities	Not Applicable	Not Applicable	Policy for Research, Minutes of the Governing Council/ Syndicate/Board of Management's Adoption of Policy, Information on Institutional Website
3.2.1	Qualitative (200 Words)	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Transfer of Knowledge and Dedicated Centre of Research	Website link of information
3.3.1	Qualitative (200 Words)	Not Applicable	Transfer of Knowledge and Dedicated Centre of Research	Same as that of universities	Not Applicable	Not Applicable	Website link of information
4.4.2	Qualitative (200 Words)	Not Applicable	Policies / Rules / Regulations / Guideline * Library Committee	Same as that of universities	Same as that of universities	Same as that of universities	Copy of Written Policy / Rule / Regulation or Guidelines
7.2.1	Qualitative (200 Words)	Not Applicable	Best Practices	Same as that of universities	Same as that of universities	Same as that of universities	Website Link of the Document that has Title, Objectives, Context, Practice, Evidence of Success, Problems Encountered and Resources Required for Best Practice

(* Means it appeared in "Guidelines to the Institutions";** Means it appeared in the "Guidelines to Peer Team (Assessors)" and *** Means it appeared in "Institutional Accreditation Guidelines to the Peer Team")

As evident from the NAAC A Grade college of Assam, excluding the metrics which are directly devoted to the library, there are 6 other metrics where the library can contribute to achieving a good NAAC grade. All these metrics are of qualitative in nature and they are Metric "2.3.2 Teachers use of online resources", "3.1.1 Institution Research facilities", "3.2.1 Transfer of Knowledge and Dedicated Centre of Research","3.3.1 Transfer of Knowledge and Dedicated Centre of Research", "4.4.2 Policies / Rules / Regulations / Guideline or Library Committee" and "7.2.1 Best Practices".

Out of all these metrics, "2.3.2 Teachers use of online resources", "4.4.2 Policies / Rules / Regulations / Guideline or Library Committee" and "7.2.1 Best Practices" are applicable to all the four types of institutions i.e., Universities, Autonomous Colleges, Affiliated / Constituent Under-Graduate Colleges and Affiliated / Constituent Post-Graduate Colleges.

However, metrics "3.1.1 Institution Research facilities" and "3.3.1 Transfer of Knowledge and Dedicated Centre of Research" are only applicable to Universities and Autonomous Colleges, whereas "3.2.1 Transfer of Knowledge and Dedicated Centre of Research" is only applicable to Affiliated / Constituent Post-Graduate Colleges.

The best practices may include those practices which are full realisation of the library's academic potential and may include information literacy programmes, research support services, instituting an annual best user award for students, research scholars and faculty members, organising different competitions, research projects taken up by the library, collection of rare books, manuscripts, special reports or any other knowledge resources for library enrichment and such others.

7. Expectations of NAAC from libraries as evident from peer team report

Out of the 22 colleges with a NAAC A Grade, Cotton College received NAAC A Grade in all three cycles of assessment and Nowgong College received NAAC A Grade in both cycle 2 and 3. All remaining colleges received the NAAC A Grade in only one cycle of assessment.

As of the date of study, both Cotton College (Cotton University) and Bajali College (Bhattadev University) have been upgraded to a university. However, they are still considered for the study because they have received the NAAC A Grade as a college as an entity.

Table 5: NAAC A grade colleges of Assam and their different dimensions

Sl.No.	Name of the College	Establish-ment Year	Date of Accredi-tation	Cycle	NAAC CGPA	NAAC Grade	Grade Point Average (Criteria-IV)
1)	Anandaram Dhekial Phookan College	1959	2019-01-19	Cycle-2	3.11	A	3.2
2)	Arya Vidyapeeth College	1958	2016-11-05	Cycle-2	3.06	A	3.2
3)	B. Borooah College	1943	2016-09-16	Cycle-1	3.04	A	3
4)	B. H. College	1966	2016-05-25	Cycle-2	3.11	A	3.2
5)	Bajali College	1955	2017-01-23	Cycle-2	3.7	A	3.7
6)	Cotton College	1901	2016-11-05	Cycle-3	3.76	A++	4
7)	Debraj Roy College	1949	2011-01-08	Cycle-2	3.11	A	3
8)	Devicharan Barua Girls College	1955	2011-09-16	Cycle-2	3.07	A	3.1
9)	Dibru College	1963	2017-05-02	Cycle-2	3.09	A	3.4
10)	Dimoria College	1979	2011-01-08	Cycle-2	3.1	A	3
11)	Gurucharan College	1935	2016-11-05	Cycle-2	3.11	A	2.7
12)	Jagannath Barooah College	1930	2012-03-10	Cycle-2	3.11	A	3.45
13)	Kaliabor College	1969	2015-11-15	Cycle-2	3.03	A	3.3
14)	Kamrup College	1966	2016-11-05	Cycle-2	3.04	A	3
15)	Lakhimpur Girls' College	1972	2014-02-21	Cycle-2	3.01	A	3
16)	Mahendra Narayan Choudhury Balika Mahavidyalaya	1979	2016-12-02	Cycle-2	3.02	A	3.3
17)	Nalbari Commerce College	1979	2016-09-16	Cycle-2	3.1	A	2.7
18)	North Lakhimpur College	1952	2011-11-30	Cycle-2	3.08	A	3
19)	Nowgong College	1944	2016-12-02	Cycle-3	3.27	A	3.8
20)	Nowgong Girls' College	1962	2015-05-01	Cycle-2	3.01	A	3
21)	Sibsagar College	1947	2017-03-28	Cycle-2	3.13	A	3
22)	Srikishan Sarda College	1950	2011-11-30	Cycle-2	3.12	A	2.85

The above table depicts that the NAAC CGPA of 11 colleges (50%) is lower than that of the Grade Point Average for (Criteria-IV) and that means that these colleges exclusively benefit from these criteria, which include their rich libraries too, whereas, in the case of, another 11 colleges (50%) the NAAC CGPA is greater than that of Grade Point Average for (Criteria-IV) and it may mean that the development of the libraries along with other which are part of Criteria-IV are lagging behind in regards to the development in other

sectors of the institute.

In identifying the main points for the libraries to consider, in the NAAC A Grade colleges of Assam, mentioning a particular point anywhere in observation or strength or weakness or challenge or recommendation in the "Peer Team Report on Institutional Assessment and Accreditation" document of a college is considered as one instance. In this way, the following table is achieved.

Table 6: Expectations of NAAC from libraries as evident from "Peer Team Report on Institutional Assessment and Accreditation" from NAAC A grade colleges of Assam

Points	Peer Team Report Mention	
	Instance / College	Percentage
General Information About the Library		
Working Hours Beyond Institute Hour	2	09.1%
Total Carpet Area of the Library	13	59.1%
Total Seating Capacity	12	54.6%
Nature of Access (Open/Closed)	3	13.6%
Library Management and Development		
Library Advisory Committee	7	31.8%
Weeding Out	1	04.6%
New Acquisition (Purchase details of books and journals for last few years)	6	27.3%
Library Physical Collection		
Total Books	20	90.9%
Total Journals	11	50.0%
Total Magazine	4	18.2%
Total Newspaper	3	13.6%
Library Electronic Collection		
Total E-Books	12	54.6%
Total E-Journals	12	54.6%
Total E-Magazine	11	50.0%
Total E-Newspaper	11	50.0%
N-LIST Membership	14	63.6%
Participation in National Manuscript Mission	1	04.6%
Service Provided		
Book Bank	2	09.1%
Access to Internet	12	54.6%
Access to Wi-Fi	4	18.2%
Photocopy Service	9	40.9%
OPAC	6	27.3%
Printing Service	2	09.1%
Scanning Service	1	04.6%
Inter Library Loan	2	09.1%
Women Study Corner	1	04.6%
Relax Reading Room	1	04.6%
Service for Specially Enabled	1	04.6%
Remote Access	2	09.1%

Points	Peer Team Report Mention	
	Instance / College	Percentage
Use of ICT in Library		
Availability of Computer	10	45.5%
LAN Setup	3	13.6%
Computerised/Automated Library (Use of ILMS)	24	109.0%
Barcoding	9	40.9%
Photocopy Machine	10	45.5%
Printer	1	04.6%
Scanner	1	04.6%
Library Website	1	04.6%
Digital Library	8	36.4%
RFID	9	40.9%
Programmes and Events		
Book Fair	1	04.6%
Best Reader Award	3	13.6%
Others		
Departmental Library	11	50.0%

The above is an exhaustive list of parameters or points that NAAC looks into and so all are crucial for those institute that wants to excel in the NAAC accreditation process. Therefore, categorisation of these into some categories to recommend the best is not desirable.

8. Conclusion

There are four metrics in the NAAC accreditation process which are exclusively for the libraries and the study of "Peer Team Report on Institutional Assessment and Accreditation" of 22 colleges with a NAAC A Grade revealed that there are six other metrics where libraries can contribute. However, even if all these were taken into consideration, it is not in line with the stress given to the libraries in different reports of the commissions and committees on education and libraries. For example, "the library is the heart of all the university's work directly so, as regards its research work, and indirectly as regards its educational work, which derives its life as its laboratories, while scientific research needs a library as well as its laboratories, while for humanistic research the library is both library and laboratory in one" (The Report of the University Education Commission, 1962, p.96) and such others. Most academic librarians still think that their parent institutions give weightage to the libraries only because it can bring a good NAAC grading. However, the study of the representation of the library in different NAAC documents and the weightage given to it in the assessment and accreditation process proved different. Instead of being a sub-criterion, the library should be an entirely different criterion in the NAAC assessment process to reflect the statement that says "the library is the heart of all the university's work".

9. Suggestions

The following are some of the suggestions for the libraries that are going to face NAAC peer team:

a) **Consulting all guidelines published by NAAC:** It is always good to have a bird's-eye view of all the details that NAAC strives for by going to all the documents published by NAAC

rather than restricting to only institute-specific documents like the documents that are prepared and published for colleges. For example, an autonomous college library, besides consulting the documents that were prepared and published by NAAC for autonomous colleges, also needs to consult the documents that were targeted at universities and other types of colleges, like affiliated and constituent colleges, as well as for the peer team members. It will provide all the details and make visible all the angles, thus helping one to be well equipped for the NAAC peer team members.

b) **Bringing everything to a presentable format:** Prepare your library's exterior and interior so that they become inviting. Proper guides to all sections, services, and facilities, including signage and naming, must be followed. Prepare your library's website, digital library, OPAC, and other digital assets for the NAAC peer team. All types of files and records should be in a presentable format. The libraries need to especially focus on less-looked-at areas like the washroom, back side of the photocopy machine, drinking water facilities, and such others. A library manual and professional PPT should also be prepared.

c) **Documenting all information and evidence for "4.2 Library as a Learning Resource":** Under "4.2 Library as a Learning Resource", there are 5 metrics: 3 are quantitative and 2 are qualitative in nature. Keep all the information required for these metrics (refer to table 3) both in soft copy and hard copy format, along with proper evidence.

d) **Preparing for other library related NAAC metrics:** Library can also be represented in the metric "2.3.2 Teachers use of online resources", "3.1.1 Institution Research facilities", 3.2.1 Transfer of Knowledge and Dedicated Centre of Research", "3.3.1 Transfer of Knowledge and Dedicated Centre of Research", "4.4.2 Policies / Rules / Regulations / Guideline or Library Committee" and "7.2.1 Best Practices". It will be good if the library takes initiative and claim under these metrics too and for that it is always advisable to keep all document and evidence related to these metrics ready (refer to table 4).

e) **Providing identified services and keeping the statistics:** The services or facilities highlighted in table 6 need to be provided by the library, and their related documentation, including the number of equipment, should be ready for the NAAC peer team to inspect.

References

Bordoloi, R. (2021). NAAC assessment team's recommendations and their compliance by the libraries of NAAC-A graded colleges of Assam. *Library Herald,* 59(3), 86-98. Retrieved from https://www.libraryherald.dlaindia.in/post/naac-assessment-team-s-recommendations-and-their-compliance-by-the-libraries-of-naac-a-graded-colleg

Naveen C. L., & Kannappannavar, B U. (2020). Impact of NAAC assessment on the development of college libraries: a study. *Library Philosophy and Practice (e-journal).* 4190. Retrieved from https://digitalcommons.unl.edu/libphilprac/4190

Jange, S. (2021). NAAC accreditation and academic libraries: librarians' role beyond librarianship. *Journal of Indian Library Association, 57* (4). Retrieved from https://www.ilaindia.net/jila/index.php/jila/article/view/1295/291

Mehta, J. & Vyas, M. (2021). Impact of library in NAAC for better visibility in enhancing research: an analysis of central universities in India. *Library Philosophy and Practice (e-journal),* 5325.Retrieved from https://digitalcommons.unl.edu/libphilprac/5325

Ministry of Education, Government of India. (1962). *The Report of the University Education Commission (December 1948 - August 1949):* Volume I. Retrieved from https://www.educationforallinindia.com/1949%20Report%20of%20the%20University%20Education%20Commission.pdf

National Assessment and Accreditation Council. (2007). *Guidelines to the Institutions (Effective from 1st April 2007).* Retrieved from http://naac.gov.in/docs/Guidelines/Guidelines_Institutions.pdf

National Assessment and Accreditation Council. (2016). *Institutional Accreditation Guidelines to the Peer Team.* Retrieved from http://naac.gov.in/docs/Guidelines/Guidelines%20For%20Peer%20Team%20SEPT%202016.pdf

National Assessment and Accreditation Council. (2020). *Guidelines for the Creation of the Internal Quality Assurance Cell (IQAC) and Submission of Annual Quality Assurance Report (AQAR) by Accredited Institutions (AQAR format in line with the revised manual of Affiliated/Constituent UG Colleges, with effect from the academic year 2020-21).*Retrieved from http://naac.gov.in/images/aqar_online_20-21/apr292022/3AQAR-Guideline_Affiliated-Constituent-UG-Colleges.pdf

National Assessment and Accreditation Council. (2021). *Guidelines to Peer Team (Assessors).* Retrieved from http://naac.gov.in/images/docs/Guidelines/Guidelines-to-Peer-Team-Members-01-04-2021.pdf

National Assessment and Accreditation Council. (n.d.). *Guidelines on quality indicators in Library and Information Services: Affiliated/Constituent Colleges.* Retrieved from http://naac.gov.in/docs/Guidelines/Guidelines-Colleges-Library.pdf

National Assessment and Accreditation Council. (n.d.). *Guidelines on quality indicators in Library and Information Services: universities/autonomous colleges.* Retrieved from http://naac.gov.in/docs/Guidelines/Library-Guidelines-Universities.pdf

University Grants Commission. (n.d.). *Status List of Approved 894 Autonomous Colleges as on Date 24.08.2022.* Retrieved from https://www.ugc.ac.in/pdfnews/0062368_Latest-832-Auto-Colleges16-06-2021.pdf

A Bibliometric Study of References Appended to Articles Published in the Journal Economica during the Period of 2011-2020

Dr. Santosh Kumar Tunga

Associate Librarian, Rishi Bankim Chandra Evening College, Naihati, West Bengal

Dr. Sanat Kumar Biswas*

Librarian, Sudhiranjan Lahiri Mahavidyalaya, Majdia, West Bengal

(*Corresponding Author)

Abstract

The goal of the present study is to analyse the citation pattern of the journal Economica to determine how Lotka's law and author productivity are used in the field of economic literature. Economica is an international journal devoted to research in all branches of economics. The article encompasses 9527 citations appended to 330 articles that appeared in volume 78, no. 309, and volume 87, no. 348 during the years 2011 to 2020. Each article was read, reviewed, and examined thoroughly before the relevant information was tallied onto different sheets. The final statistical data that was gathered was stored, tabulated, presented, and analysed using an MS Excel spreadsheet and MS Word to create tables, diagrams, and figures. Finally, all the collected data has been recounted, compiled, tabulated, and analysed for making observations. According to the findings, the average number of citations per issue was 208.675. Journal articles comprise the majority of cited literature with 6173 (64.795%), followed by books with 2097 (22.011%). 4879 (79.038%) of the 6173 journal citations are for multi-authored journals, while 1294 (20.962%) are for single-authored journals. The economic literature appended to journal articles published in the Economics of Author Productivity Distribution is not suitable for Lotka's law.

Keywords: Author productivity, Bibliometric study, Citation analysis, Economic literature, Economica, Lotka's law

1. Introduction

Citation analysis is a mathematical evaluation of the references or citations that are appended as a necessary component of every scientific communication. Analysis of cited papers is now a common practice in practically all scientific communications and an established aspect of information research. It is used to assess the significance of certain articles, periodicals, authors, etc. (Gawande & Choukhande, 2013). Citation analysis as a tool is also used to identify the core references in a subject by counting the citations appended at the end of each scientific article. It is a method that incorporates the information-gathering process described in research writing to help in finding important information sources (White, 1985).

To determine the value of the information resources accessible in their libraries, information professionals conduct bibliometric or citation analyses in the specific domains of their libraries. The literature that scholars in other areas have used has also been revealed via citation analysis. In order to ascertain how Lotka's law and author productivity are used in the field of economic writing, this article undertakes an effort to analyse the citation pattern of the Economica literature.

2. Previous studies

In India and around the world, numerous citation analyses in several different subject areas have been carried out in a single journal, such as the Journal of Family Welfare (Halker, 1998); Defence Science Journal (Viz & Vedi,1999); Ethnobotany journal, (Dhiman, 2000); Journal of Indian Coffee (Sivasubramanian, 2000); Journal of Tobacco Research (Suryanarayana, 2000); Indian Journal of Pure & Applied Mathematics (Dutta & Sen, 2001); Indian Journal of Economics (Shokeen & Koushik, 2003). The study also included Wei's (2018) works on the top five Economics journals and Palanivel and Baskaran's articles from 2018 and Chaudhari's from 2020 both appeared in the journal Economic Theory. However, the International Journal of Economica, New Series has yet to publish any studies.

A review of previous studies on author productivity and the application of Lotka's Law to a number of disciplines including Schorr's (1974), discovery of a quadruple (x - 4) law in additional observations about library organisation as opposed to the inverse quadratic Lotka (x-2). When Voos (1974) examined the output of authors in the field of information science between 1966 and 1970, he compared the findings to Lotka's observation (n=2) and found that the distribution of authors had successfully adapted to a new constant of x-3.5. A bibliography on Lotka and related works, including those on Bradford and Zipf, as well as the frequency distribution and bibliometrics were offered by Vlachy (1978). In a research on the entomology of Nigeria, Gupta (1987) examined the productivity models of writers and examined the applicability of Lotka's law to four different groupings of data. It is shown that none of the four groups of data were subject to Lotka's Law, in its original form as an inverse quadratic. Sen et al. (1996) attempted to calculate Lotka's law in the field of information science and verified that it holds true in this area. After examining the output of Spanish authors in the fields of librarianship and documentation, Jimenez and Anegon (1997) came to the conclusion that Lotka's law adequately reflected the distribution of the data.

A thorough review of the research conducted by the biotechnology faculties at the Central Universities of India from 1997 to 2006 was presented by Sevukan and Sharma (2008). The findings showed a steady increase in the amount of biotechnology literature, from 15 articles in 1997 to 43 articles in 2006; a pattern of authorship that is dominated by two-authored publications; and evidence supporting the applicability of Lotka's Law from the values of n=2.12, C=0.669, and D=0.027 obtained by the least square method. According to Sobrino et al. (2008), Lotka's Law can be applied to all writers who published works in the field of information science between 1996 and 2007. The findings revealed the following data: one pending equals a "2,75," the obtained value is lower in Voos's (1974) work than in Sen et al.'s (1996) work in this camp; the proportion of authors who are sole word executors is 79 percent, which is a superb adjustment to Lotka's Law

for use with Kolmogorov-Smirnov. Kumar (2010) investigated the application of Lotka's Law to the distribution of research production in CSIR, India, as a general inverse power (2) and as an inverse square power relationship (=2). From SCI CD-ROM and Web of Science, two data sets of the research articles (6076 and 17681) that CSIR scientists produced between 1988 and 1992 and 2004 and 2008, respectively, were gathered. The degree of agreement between the observed data distribution and the theoretical value of =2 and the inverse general power connection was assessed using the K-S Test. It was discovered that Lotka's inverse square law did not support this. Sen (2010) showed how easily the values of c and the equation of Lotka's Law can be computed. The value acquired using the procedure outlined in the study appears to be at least as excellent as the value obtained using Pao's method. When compared to Pao's method, the procedure is simpler. K-S testing was done by Tsai and Chiang (2011) to confirm the accuracy of Lotka's Law. The distribution of frequency indices of author productivity is consistent with Lotka's Law after being put through the K-S test.

3. Objectives of the study

The objectives of the current study are:

- to identify the year-wise distribution of articles
- to determine the frequency distribution of references cited
- to classify the form-wise distribution of cited literature
- to examine the nature of the authorship pattern
- to identify the authorship pattern of journal articles
- to ascertain the author's productivity in journal articles
- to find out to what extent, the author's productivity of cited journal articles conforms to Lotka's Law.

4. Source journal: Economica

The present study examines 9527 citations that were appended to 330 publications that appeared in Economica volumes 78, number 309 (2011)-87, number 348 (2020). The publication 'Economica' has been chosen as the source journal in this case. Research in all areas of economics is the focus of the international journal Economics. The entire international research community contributes theoretical and empirical studies for publication. Leading economics journal Economica is ranked well in published citation counts. Each issue includes a primary paper and a review section that covers a wide selection of newly published books on different levels. Special issues on certain subjects are occasionally published and are either available in single back issues or, if possible, are a part of the annual subscription. The London School of Economics and Political Science, the Suntory and Toyota International Centres for Economics and Related Disciplines, and Blackwell Publishers Ltd. publish Economica (ISSN 0013-0427), a quarterly journal printed in Bristol by J. W. Arrowsmith Ltd.

5. Materials and methods

The study's data come from journal Economica articles published between 2011 and 2020. These 10 volumes and 40 issues of Economica served as the foundation for the citations, which were compiled by compiling accurate citations from each article in each issue of the source journal. Each article's citations can be found under the category "References" at the end. Each citation was photocopied from the sources and then copied

onto 3"x5" slips. Each article is then scanned, checked, reviewed, and collated into individual sheets with the relevant information. The final statistical data that was gathered was stored, tabulated, presented, and examined using MS-Excel spreadsheet and MS-Word to create tables, diagrams, and figures. Finally, all of the information gathered was retold, organised, calculated, and examined in order to draw conclusions. The following factors were taken into consideration throughout the analysis: (i) the distribution of citations by volume; (ii) the distribution of citations by form; (iii) the pattern of authorship of cited journals by year; (iv) the distribution of author productivity of cited journals; and (v) the applicability of Lotka's law in economic literature.

6. Lotka's Law

An inverse square law relating the number of contributions made by each author to a scientific paper has been proposed. The frequency of publications by authors on a certain topic is described by Lotka's Law. In addition, it says that roughly 60% of all contributors make a single contribution, with the number of writers making n contributions being about 1/na of those producing one. Accordingly, 60% of writers on a given topic will only have one publication, 15% will have two publications (1/22 times x 60), 7% will have three publications (1/32 times x 60), and so on. . This law can be expressed as:

$$X^n \times y = c, \quad or \quad y = c/x^n, \quad or \quad y = c \times x^n \quad \ldots\ldots\ldots\ldots(1)$$

Where, x is the number of publications of interest (1,2, etc); n is an exponent that is constant for a given set of data; y is the expected percentage of authors with frequency x of publications, and c is a constant.

In order to ascertain whether the horticultural literature is consistent with Lotka's Law or not, it was advised to undertake an analysis that calculated the slope n value and the constant c value using the Kolmogorov-Smirnov (K-S) examination. It can be expressed as Pao

$$n = (N\sum XY - \sum X \sum Y) / (N\sum X^2 - (\sum X)^2) \quad \ldots\ldots\ldots\ldots(2)$$

Where N is the number of data pairs considered; X is the logarithm of x (x is the number of articles) and Y is the logarithm of y (y is the number of authors). Then get the constant c value by the following equation:

$$c = 1/ \sum_1^{p-1} 1/X^n + 1/(n-1)\ (p^{n-1}) + 1/2p^n + \ldots\ldots\ldots + n/24(p-1)^{n-1} \quad or, \quad c = 1/\sum(1/x^n) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3)$$

To verify that the observed distribution of author productivity fits the estimated distribution, he suggested applying the non-parametric Kolmolgorov-Smirnov (K-S) goodness-of-fit test. In order to do this, the biggest difference between the actual and estimated accumulated frequencies was determined, and this number was compared with the critical value (c.v.) derived from the equation below:

$$c.v. = 1.63/\sqrt{\{\sum y_x + \sqrt{(\sum y_x/10)}\}} \ldots\ldots\ldots(4)$$

D = Dmax = Differences between the columns of the observed and expected cumulative frequencies $= \sum f(x) - \sum(y_x/\sum y_x)$

7. Data analysis and discussion

There are total 9527 citations appended to 330 journal articles contributed by 763 authors during the year 2011 - 2020. Citations are found at the end of each article under the heading "References".

7.1 Year-wise distribution of articles and citations

Table 1 shows the distribution of publications and citations by year and volume from 2011 to 2020. It displays the trends in the articles' output over the course of the time period.

Table 1: Volume-wise distribution of articles and citations

Year	Volume (No.)	Total articles	No. of citations	Average no. of citations per article	% of articles	% of citations
2011	78 (309-312)	36	1028	28.555	10.909	10.790
2012	79 (313-316)	33	897	27.181	10.000	9.415
2013	80 (317-320)	32	978	30.562	9.697	10.266
2014	81 (321-324)	30	898	29.933	9.090	9.426
2015	82 (325-328)	36	1126	31.278	10.909	11.820
2016	83 (329-332)	27	695	25.741	8.182	7.295
2017	84 (333-336)	35	984	28.114	10.606	10.328
2018	85 (337-340)	34	1098	32.294	10.303	11.525
2019	86 (341-344)	29	759	26.172	8.788	7.967
2020	87 (345-348)	38	1064	28.000	11.516	11.168
Total	10 Volumes	330	9527	28.791	100.000	100.000

Economica published 330 papers in 10 volumes and 40 issues, containing 9527 citations, for an average of 8.25 articles per issue (330 articles/40 issues) and 28.791 citations per article throughout the study period. Each issue contained an average of 238.175 citations (9527 citations/40 issues). The most articles-38 (11.5167%)-will be published in 2020. The most citations were made in the year 2015 (1126; 11.82%).

7.2 Form-wise distribution of cited literature

The study of citations depending on bibliographic formats is presented in table 2. Literature on economics has appeared in a variety of publications. The highest numbers of citations are from journals, according to the ranking of cited sources.

Table 2: Form-wise distribution of cited literature

Rank	Form of Literature	Total no of citation	Cumulative Citation	Percen-tage	Cumulative percentage
1	Journals	6173	64.795	6173	64.795
2	Books	2097	22.011	8270	86.806
3	Working Papers	569	5.972	8839	92.778
4	Websites	217	2.278	9056	95.056
5	Discussion Papers	189	1.984	9245	97.040
6	Theses	84	0.882	9329	97.922
7	Conference Proceedings	52	0.546	9381	98.468
8	Reports	46	0.483	9427	98.951
9	Research Papers	31	0.325	9458	99.276
10	Unpublished Documents	26	0.273	9484	99.549
11	Govt. Publication	20	0.210	9504	99.759
12	Monographs	13	0.136	9517	99.895
13	Others	10	0.105	9527	100.000
	Total	9527	100.000	9527	100.000

Out of a total of 9527 citations, 6173 (64.795%) are from journals, followed by 2097 (22.011%) from books, 569 (4.972%) from working papers, and 217 (2.278%) from websites. In other words, 8270 (86.806%) are books and journals. Discussion papers, Theses, Reports, and Research Papers make up the remaining 13.194% of citations.

7.3 Authorship patterns of articles

According to the number of cited authors, table 3 shows the distribution of articles with referenced authorship patterns. 1294 (20.962%) of the 6173 references are single-authored journals.

Table 3: Year wise distribution of articles

No of Authors / Year	1	2	3	4	5	6	7	8 & above	No of Articles
2002	63	118	128	24	12	6	1	2	354
2003	47	77	74	35	4	-	-	1	238
2004	38	98	29	41	2	-	2	2	239
2005	65	126	154	39	8	7	-	3	402
2006	100	165	30	45	5	3	2	1	351
2007	49	89	91	53	6	-	3	-	291
2008	58	144	75	64	3	6	1	3	354
2009	72	67	22	59	10	3	2	-	235
2010	97	128	49	62	9	8	3	-	356
2011	86	116	95	81	2	8	-	1	389
2012	83	147	119	50	10	6	2	3	420
2013	82	162	72	35	5	5	1	-	362
2014	41	247	47	28	9	7	-	2	381
2015	88	150	58	74	7	4	3	3	387
2016	75	181	42	66	4	-	4	3	375
2017	90	167	78	46	7	7	1	-	396
2018	115	73	105	19	6	6	-	2	326
2019	34	62	54	30	2	1	2	-	185
2020	11	54	36	25	3	2	1	-	132
Total	1294	2371	1385	876	114	79	28	26	6173
Percentage (%)	20.962	38.408	22.437	14.191	1.847	1.280	0.454	0.421	100.000

4879 journals (79.038%) have multiple authors. With 115 citations, the year 2018 saw a higher number of single author contributions cited, compared to 100 citations in 2006 and 97 citations in 2010. 34 citations in 2019 are the fewest for works with a single author. The number of citations for two author contributions among multi-author papers is higher, at 2371 (38.408%), followed by 1385 (22.437%) for three author contributions and 876 (14.191%) for four author contributions. According to the study, collaborative research in the subject of economic literature is growing.

7.4 Author productivity

In order to determine the pattern of authorship in the economic literature, the study examined the citations by the number of authors. It is evident that the number of authors in the cited journals is largest for two writers (38.408%), followed by three authors (22.437%) and a single author (20.962%).

Table 4: Distribution of author productivity

No. of Publication (x)	No. of Authors (y)	% y	x.y	∑xy	% of ∑xy	∑y	% of ∑y
11	1	0.016	11	11	0.073	1	0.016
10	3	0.049	30	41	0.271	4	0.065
9	2	0.032	18	59	0.390	6	0.097
8	20	0.324	160	219	1.445	26	0.421
7	28	0.454	196	415	2.739	54	0.875
6	79	1.280	474	889	5.866	133	2.155
5	114	1.847	570	1459	9.628	247	4.001
4	876	14.191	3504	4963	32.750	1123	18.192
3	1385	22.437	4155	9118	60.169	2508	40.628
2	2371	38.408	4742	13860	91.461	4879	79.038
1	1294	20.962	1294	15154	100.000	6173	100.000
Total	6173	100.000	15154	15154	100.000	6173	100.000

Table 4 shows that there would be 6173 articles overall, written by 15154 authors, with an average of 2.455 authors per piece. The outcome shows that multiple authors typically contributed to economic literature.

7.5 Calculation of the exponent 'n' for economic literature

Table 5: Calculation for the exponent 'n'

No. of Publication (x)	No. of Authors (y)	X= Log x	Y= Log y	XY	X^2
11	1	1.041	0.000	0.000	1.084
10	3	1.000	0.477	0.477	1.000
9	2	0.954	0.301	0.287	0.910
8	20	0.903	1.301	1.175	0.815
7	28	0.845	1.447	1.223	0.714
6	79	0.778	1.898	1.477	0.605
5	114	0.699	2.057	1.438	0.489
4	876	0.602	2.942	1.771	0.362
3	1385	0.477	3.141	1.498	0.228
2	2371	0.301	3.375	1.016	0.091
1	1294	0.000	3.112	0.000	0.000
Total	6173	7.600	20.051	10.362	6.298

By the result of the calculation in table 5, it could bring into the equation of Lotka's Law as below to calculate n value:

$$n = (N\sum XY - \sum X \sum Y) / \{N\sum X^2 - (\sum X)^2\}$$

$$= (11\times10.362 - 7.6\times20.051) / \{11\times6.298 - (7.6)^2\}$$

$$= (113.982 - 152.387) / (69.278 - 57.76)$$

$$= -38.405/11.518 = -3.334$$

7.6 Application of Lotka's Law

Table 6 : The K-S test for economic literature

No. of Publications (x)	No. of Authors (y)	$y_x/\sum y_x$	$\sum (y_x/\sum y_x)$ (Observed)	$1/x^n$	$f_x = C(1/x^n)$	$\sum f_x$ (Expected)	D=
1	1294	0.2096	0.2096	1.0000	0.8747	0.8747	0.6651*
2	2371	0.3841	0.5937	0.0992	0.0867	0.9614	0.3677
3	1385	0.2243	0.8180	0.0256	0.0223	0.9837	0.1657
4	876	0.1420	0.9600	0.0098	0.0085	0.9922	0.0322
5	114	0.0185	0.9785	0.0046	0.0040	0.9962	0.0177
6	79	0.0129	0.9914	0.0025	0.0022	0.9984	0.0070
7	28	0.0046	0.9960	0.0015	0.0013	0.9997	0.0037
8	20	0.0032	0.9992	-	-	-	-
9	2	0.0003	0.9995	-	-	-	-
10	3	0.0004	0.9999	-	-	-	-
11	1	0.0001	1.0000	-	-	-	-
Total	6173	1.0000	1.0000	1.1432	-	-	-

Value c is calculated by using following formula:

$$c = 1/\sum_1^{p-1} 1/X^n + 1/(n-1)\,(p^{n-1}) + 1/2p^n + \ldots\ldots + n/24(p-1)^{n-1}$$

or, $c = 1/\sum(1/x^n) = 1/1.1432 = 0.8747$

when we get n = -3.334 and c = 0.8747, it explored:

$f(x) = c\ (1/x^n) = 0.8747\ (1/x^{-3.334}) = 0.8747\times x^{3.334}$

From table 6, we can find D ($D = \max|\sum f(x) - \sum(y_x/\sum y_x)| = 0.6651$

According to K-S test, the critical value (c.v.) is c.v. = $1.63/\sqrt{\{\sum y_x} + \sqrt{(\sum y_x/10)}\} = 0.0207$

In this case, Dmax exceeds the crucial value for the K-S test. The distribution of author production does not follow Lotka's Law, as this result showed. The Lotka's Law is therefore inappropriate for the economic literature on the distribution of author production, according to the result.

8. Major findings

The following findings are drawn based on the journal Economica's citation analysis, which was conducted on 330 articles with a total of 9527 citations provided by 574 authors between 2011 and 2020.

- Every issue published 8.25 articles on average having 28.791 citations in each article during this study period.
- Average number of citations appeared to be 238.175 citations in each issue. The highest number of articles published during 2020 is 38 (11.5167%). The year 2015 has the highest number of citations i.e., 1126 (11.820%).
- Most of the citations 6173 (64.795%) were drawn from the journals. A sizable number of citations in 2097 (22.011%) were from books.
- The maximum number of articles were written by two authors 2371 (38.408%) and by single authors 1294 (20.962%).
- The distribution of author productivity on economics literature appended to articles published in the journal Economica is not matched by Lotka's Law.

9. Conclusion

In the present paper, the investigators have attempted to study the authorship pattern with an emphasis on the applicability of Lotka's Law in the field of economic literature. This citation analysis aids in understanding the pattern of economic academics' authorship and research. The outcomes of this analysis also contribute to our understanding of information scientists generally and of economic literature in particular. The majority of scholarly publications were single-authored, according to earlier surveys. Despite the fact that multi-authorship has shown a striking trend in recent years. This is accurate for this particular study as well, given the interdisciplinary nature of the topic. Single-author papers outnumber multi-author papers by a ratio of 1: 3.77.

References

Chaudhari, B. T. (2020). A citation analysis of economic theory. *International Journal of Research in Library Science,* 6(1), 110-116.

Dhiman, A, K. (2000). Ethnobotany journal: a ten years bibliometric study. *IASLIC Bulletin,* 45(4), 177-182.

Dutta, B., & Sen, B. K. (2001). Indian journal of pure and applied mathematics: an analysis of citation pattern. *IASLIC Bulletin,* 46(4), 221-226.

Gawande, S. R., & Choukhande, V. (2013). Citation use pattern of doctoral theses of library and information science of Sant Gadge Baba Amravati University. *e-Library Science Research Journal.* 1(4), 1-12.

Gupta, D. K. (1987). Lotka's law and productive patterns of entomological research in Nigeria for the period 1900-1973. *Scientometrics,* 12(1-2), 33-46.

Halkar, G. G., Senapati, S. K., & Chand, S. (1998). Journal of family welfare: a bibliometric study. *IASLIC Bulletin,* 43(2), 89-94.

Jimenez, E. C., & Anegon, F. M. D. (1997). Analisis de la autoria en revistas espanolas de biblioteconomia y documentacion: 1975-19995. *Revista Espanola de documentacion Cientifica,* 20(3), 252-66.

Kumar, N. (2010). Applicability to Lotka's Law to research productivity of Council of Scientific and Industrial Research (CSIR), India. *Annals of Library and Information Studies,* 57, 1-5.

Lotka, A. J. (1926). The frequency distribution of scientific productivity. *Journal of the Washington Academy of Science,* 16, 317-323.

Palanivel, K., & Baskaran, C. (2018). Bibliometric analysis of the journal-Economic Affairs. *International Journal of Research in Library Science,* 4(1), 2-10.

Pao, M. L. (1986). An empirical examination of Lotka's Law. *Journal American Society for Information Science,* 37, 26-33.

Schorr, A. E. (2010). Lotka's Law and library science. *Reference Quarterly,* 14(1), 32-33.

Sen, B. K. (2010). Lotka's Law: a viewpoint. *Annals of Library and Information Studies,* 57, 166-67.

Sen, B. K., Taib, C. A., & Hassan, M. F. (1996). Library and information science literature and Lotka's Law. *Malaysian Journal of Library & Information Science,* 1(2), 89-93.

Sevukan, R., & Sharma, J. (2008). Bibliometric analysis of research output of biotechnology faculties in some Indian Central Universities. *DESIDOC Journal of Library & Information Technology,* 28(6), 11-20.

Shokeen, A., & Kaushik, S. (2003). Indian Journal of Economics. *Library Herald,* 41(2), 109-114.

Sivasubramanian, V. J. (2000). Indian coffee: a bibliometric study. *Annals of Library and Information Science Documentation,* 47(2), 75-79.

Sobrino, M. I. M., Caldes, A. I. P., & Guerrero, A. P. (2008). Lotka Law applied to the scientific production of information science area. *Brazilian Journal of Information Science,* 2(1), 16-30.

Suryanarayana, Y. V. (2000). Bibliometric analysis of contribution of Journal of Tobacco Research. *Annals of Library Science and Documentation,* 47(3), 81-100.

Tsai, H., & Chiang, J. K. (2011). E-Commerce research trend forecasting: a study of bibliometric methodology. I*nternational Journal of Digital content tech and its applications,* 5(1), 101-10.

Tunga, S. K. (2014). Authorship pattern and degree of collaboration in journal articles: a citation study of doctoral dissertations 1991-2010. *Information Studies,* 20(2), 85-96.

Vij, R., & Bedi, D. S. (1998). Defence Science Journal: a ten year bibliometric study. *ILA Bulletin,* 34(1-2), 39-44.

Vlachy, J. (1978). Frequency distribution of scientific performance: a bibliography of Lotka's Law and related phenomena. *Scientometrics,* 1(1), 109-130.

Voos, H. (1974). Lotka and information science. *Journal of the American Society for Information Science,* 25(4), 270-72.

Wei, G. A. (2018). Bibliometric analysis of the top five economic journals during 2012-2016. *Journal of Economic Surveys,* 33(1), 25-59.

White, E. C. (1985). Bibliometrics from curiosity to convention. *Special Libraries,* 76(1), 38-39.

ICT Practices in Library Schools of India and USA: a comparative study

Poonam Rani

Research Scholar, Department of Library and Information Science, Maharshi Dayanand University, Rohtak

Prof. Nirmal Kumar Swain

Professor, Department of Library and Information Science, Maharshi Dayanand University, Rohtak

Abstract

This paper presents a comparative study of the ICT practices in Library and Information Science (LIS) curricula at the master's level between library schools in India and the USA. Six library schools were selected, three from each country. The data was collected from the official websites of the respective universities. It concludes that a curriculum approach is effective, justifiable, and can be customised to address the gaps in the rapidly evolving information profession. It is suggested that there should be more frequent revisions of the LIS course curriculum in India, similar to the United States, where curriculum revisions are done more frequently across most departments. Revising the LIS curriculum regularly can be updated and aligned with the changing demands and requirements of the field.

Keywords: Curricula, Education, ICT (Information and Communication Technology) practices, Library and Information Science (LIS), Library schools, Syllabi

1. Introduction

Professionals in LIS were previously recognised as the guardians of the books, while libraries were merely considered places to store books. The situation has completely changed as a result of technological improvements. The rapid development of technology is the main force behind the change in the LIS fields. There is a revolutionary change in the services provided by libraries as the traditional information sources have been replaced with online databases, e-resources, retrieval and storage of information, etc. The complex housekeeping methods that libraries use have been altered by information and communication technology, facilitating communication. Through networks for information collection, storage, and transmission, libraries have evolved into a large ocean of internet-based services.

Every profession, including librarianship, has been significantly impacted by ICT. The abundance of information and the high expectations of users provide challenges for LIS professionals. The needs of society and how librarians and information professionals work have evolved due to ICT. The dissemination of information has undergone significant changes in the past two decades, with the emergence of e-publications and the digitisation of printed culture. As

more printed books are digitised, libraries need to address the preservation of printed heritage for future generations. The modern library landscape has been transformed by technology, the digitalisation of information, the availability of e-resources, and evolving user demands. In the present scenario, LIS professionals transition into the role of IT experts or technology managers due to the extensive changes in traditional methods of information storage, retrieval, and distribution mechanism owing to ICT involvement.

2. Literature review

It was found that iSchools may organise more conferences and forums to exchange ideas on archival studies and education issues (Li, & Chiu, 2022). The article "Core Knowledge and specialised skills in Academic Libraries" conducted a comparative survey-based study to examine the skills, knowledge, and competencies of information professionals and LIS academic library faculty in the evolving library profession (Saunders, 2020). Another study discussed the key events and players in the beginning and development of the discipline of LIS education in the USA (Richardson, 2010). The author also described the intellectual foundation and history of the LIS discipline as it was developed at the University of Chicago. A study that overviews India's LIS education. The authors examine the historical progression of LIS education in the country and discuss the development of the LIS curriculum (Jain et al., 2007; Biswas, 2021). The paper traced the beginning and growth of Ph.D. programmes in LIS education in India(Biswas, 2013; Biswas & Chakrabarti, 2014). Based on the reviewed literature, there seems to be a relative dearth of studies relating to a comparative account of Capacity Building Initiatives in LIS educationin India and America (Satija, 1999). The study analyses the influence of ICT on the LIS curriculum. The author explores the transition from print to online resources, the emergence of open access, and the utilisation of institutional repositories for knowledge sharing and information services. The study highlights challenges such as the lack of accreditation, the proliferation of LIS schools, inadequate resources on Information and Communication Technology and a shift from traditional techniques (Singh, 2003).

3. Statement of the research problem

This research paper examines and compares the current status of ICT practices in LIS schools in India and USA. Furthermore, the study aims to evaluate the influence of factors such as the LIS Curriculum, LIS schools, and ICT papers' integration into the evolving styles within LIS education in both countries.

4. About the library schools

The three oldest LIS schools both from India and the USA were selected for the comparative study.

4.1 Banaras Hindu University (BHU)

The Department of LIS education at BHU, established in 1941, is a pioneering institution in the field. The department started with a Diploma in Librarianship and in 1965, the department introduced the MLISc programme.

4.1.1 *LIS programmes offered at BHU*

- Ph.D.
- MLISc.: Master of Library and Information Science
- M.A. in Manuscriptology

4.2 Aligarh Muslim University (AMU)

The University's LIS department began with a "Certificate Course in Library Science"

in 1950-1951. Eventually introduced the country's first "Bachelor of Library Science" programme in 1958-1959 and the "Master of Library Science" programme in 1970-1971.

4.2.1 ***LIS programmes offered at AMU***

- Ph.D.
- M.Lib.I.Sc.: Master of Library & Information Science
- B.Lib.I.Sc.: Bachelor of Library and Information Science

4.3 University of Delhi (DU)

The Department of Library and Information Science was established in 1946 under the faculty of arts at the University of Delhi. Visionaries like S. R. Ranganathan and S. Das Gupta played a significant role in its inception as a pilot project of UNESCO. It is one of the earliest and most esteemed departments in the history of LIS in India.

4.3.1 ***LIS programmes offered at DU***

- Ph.D.
- Mphil
- M.Lib.I.Sc.: Master of Library & Information Science
- B.Lib.I.Sc.: Bachelor of Library and Information Science

4.4 McGill University (MGU)

The School of Information Studies (SIS) at McGill University in Canada has offered LIS programmes since 1897. It introduced the first MIS programme in librarianship worldwide. In 1956 the Faculty of Graduate Studies and Research established the "Master of Library Science" programme.

4.4.1 ***LIS programmes offered by MGU***

- PhD in Information Studies
- Master of Information Studies
- Online Graduate Certificates
- Graduate Certificates

4.5 University of Michigan (MU)

Since its establishment in 1926, the School of Information at MU has achieved significant milestones. In 1927 and became the first department in the country to receive ALA accreditation. 1948 the department replaced its graduate programme with a master's degree.

4.5.1 ***LIS programmes offered at MU***

- PhD in Information
- Master of Applied Data Science
- Master of Science in Information
- Master of Health Informatics
- Bachelor of Science in Information
- Undergraduate minors
- Non-degree offerings

4.6 Oklahoma University (OU)

The Department of Arts and Science was recognised in 1929 and offered degrees in Library Science. It gained accreditation from the ALA in 1956. The master-level programmes were later replaced by the MLIS programme in 1980.

4.6.1 ***LIS programmes offered at OU***

- Ph.D. in Information Studies
- Master of Library and Information Studies
- Dual Master's
- Bachelor's and Master's Accelerated program
- Graduate Certificates
- Bachelor of Science in Information Science & Technology

- Bachelor of Arts in Information Studies
- Information Studies Minors

5. Objectives

The present study has been planned to achieve the following objectives

- to compare the course curricula at the masters level in India and USA.
- to examine the role of ICT courses in the development library science profession.

6. Methodology

India's three oldest central universities having accreditation by National Assessment and Accreditation Council (NAAC) and three oldest universities in America having accreditation by American Library Association Accredited (ALA) were selected for comparative purposes at the master's level. All the relevant information was retrieved from the official websites. The credits, most frequented preferred areas, highlighted areas, syllabus, faculty, intake, type, at the masters' level of the concerned universities of both countries are compared. The collected data were analysed by using MS-Excel software.

7. Scope and limitations of the study

The current study looked at the different levels of LIS courses offered by LIS departments at a few LIS schools in India and USA. The teaching staff (regular and permanent) employed by the departments of LIS in both nations, accreditation, and courses in particular ICT-related topics are subject to this investigation. The study does not consider LIS instructors who work temporarily, on contracts, or as guests.

8. ICT practice

LIS specialists require high technical knowledge and proficiency in using hardware and software, storage, retrieval, and dissemination of resources, information systems, sources, and database searching. With the use of ICT, one can become a problem-solver, develop research abilities, and be able to recognise student needs and cater instruction to them. So that library professionals are capable of handling new technology, the LIS education system must prepare librarians for entry into the sector through an appropriate updated curriculum. The necessary skills and professional qualities of professionals have expanded and improved in recent years due to the usage of IT and ICT in LIS education. The increased use of IT and ICT in LIS education may promote online learning and e-resource usage. Professionals travel overseas to study, research, advance their education, attend workshops, and improve ICT and IT capabilities. The detailed comparison of ICT curricula in selected LIS schools is presented in table no. 1, 2 and 3 followed by the graphical presentation in fig. 1 and 2.

Table No. 1: Comparison of LIS education in India and USA (on the basis of year of establishment of department, university and master's programme)

Name of Country	INDIA			USA		
University	BHU, Varanasi	AMU, Aligarh	DU, Delhi	McGill University	University of Michigan	Oklahoma, University
Type of the University	Central	Central	Central	Public research	Public research	Public research
University Establishment Year	1916	1920	1922	1821	1837	1890
Department Establishment Year	1941	1950	1946	1927	1926	1929
Name of Faculty	"Faculty of Arts"	"Faculty of Social Science"	"Faculty of Arts"	"Faculty of Arts"	"Information"	"College of Arts and Science"
Name of Department	"Department of Library and Information Science"	"Department of Library and Information Science"	"Department of Library and Information Science"	"School of Information Studies"	"School of Information"	"School of Library and Information Studies"
Master's Establishment Year	1965	1970	1949	1956	1948	1954

Table no. 1 compares LIS education in India and USA (on the basis of year of establishment of the department, university and master's programme offered by selected LIS schools).

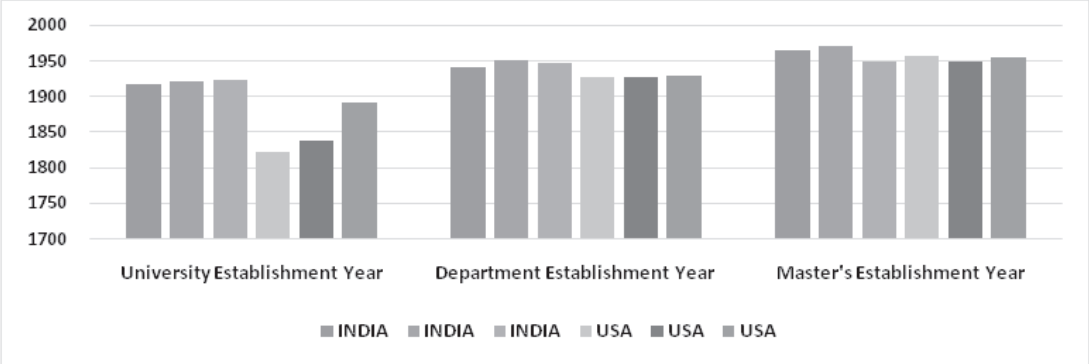

Fig. 1 Comparison of LIS education in India and USA (on the basis of year of establishment of department, university, and master's programme)

Table 1 findings indicate that while each university's establishing year differs in the cases of the two nations, the department's establishment year is essentially the same for all LIS schools. In selected Indian universities, the department's name is the same; nevertheless, LIS departments in the United States diverge. The art faculties at BHU, DU, and McGill University first offered LIS programmes. This graph shows that DU, founded in 1922, began operations in LIS schools in 1946 and offered master's programmes in 1949.The master's programme at BHU, founded in 1916 and currently the leader among other selected Indian universities, began in 1965. AMU followed a master's programme in 1970. Selected American LIS schools are ALA-accredited public research universities that have offered LIS education from the field's foundation. The University of Michigan was founded in 1821 and gave master's degrees in 1956, while McGill University began its master's programme in 1948. In 1954 OU began offering master's programmes through its College of Arts and Sciences faculty.

Table 2: Comparison of LIS education in India and USA (on the basis of papers (core and ICT), credit/hours and teachers

Name of Country	INDIA			USA		
University	BHU, Varanasi	AMU, Aligarh	DU, Delhi	McGill University	University of Michigan	Oklahoma, University
Name of Department	"Department of Library and Information Science"	"Department of Library and Information Science"	"Department of Library and Information Science"	"School of Information Studies"	"School of Information"	"School of Library and Information Studies"
Level	"Master of Library and Information Science" (MLIS-1965)	"Master of Library and Information Science" (MLIS-1970)	"Master of Library and Information Science" (MLIS-1949)	"Master of Information Studies" (MISt - 1956)	"Master of Science in Information" (MSI- 1948)	"Master of Library and Information Studies" (MLIS-1954)
Teachers	6	8	7	11	9	13
Accreditation	NAAC A	NAAC A	NAAC A+	ALA (1927)	ALA (1926)	ALA (1929)
Total Credits/Hours	80	96	115	48	48	36
Core Papers	16	22	18	6	6	6
ICT Papers	4	5	4	4	6	6

Table no. 2 compares LIS education in India and USA based on core courses and number of ICT courses, teachers and necessary conditions of credit/hours to complete of master's successfully. Here the selected Indian LIS schools are accredited by NAAC and American LIS schools by ALA.

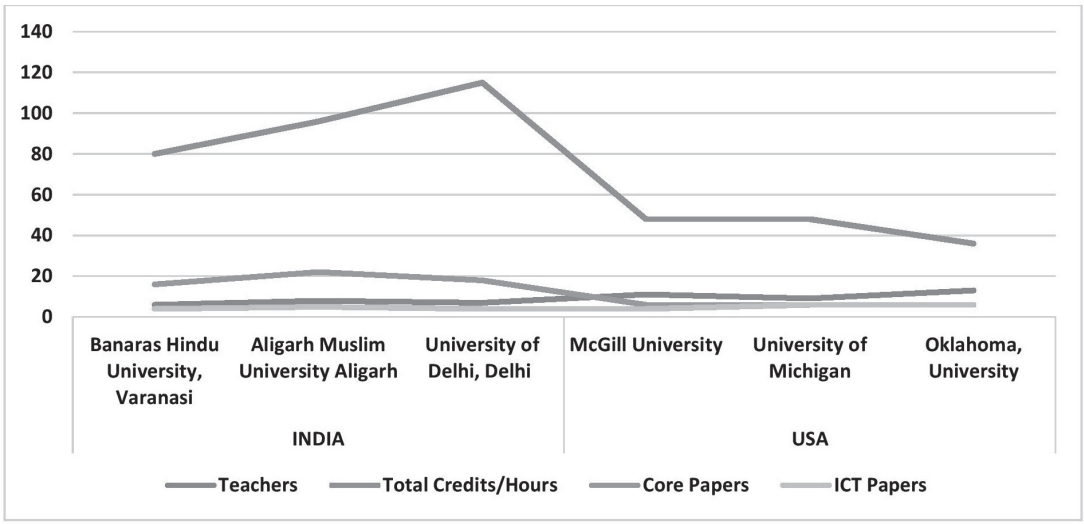

Fig. 2: Comparison of LIS education in India and USA (on the basis of papers (core and ICT), credit/hours and teachers)

According to the study, several degrees (of LIS courses) are offered by chosen universities from India and the USA. The tables and graphs show the history of LIS education in India and the United States.Both nations have separate master's programmes and faculties at the individual national level. LIS schools in the USA have more programmes available than those in India. American LIS schools hire more full-time lecturers than Indian LIS institutions, offering many more ICT-related courses than theoretical ones. The credits vary in both countries, but American LIS schools offer nearly the same credits/hours compared to the Indian LIS education system.The graph shows numbers; the DU awards the most credits 115 in the master's course. Then the course with the greatest credit total is 96 offered by AMU. The MU and McGill University offer 48 credits and OU school offers a minimum 36 hours master's course.

Table 3: ICT courses in library schools

Sr. No.	ICT Courses	Name of University					
		BHU	AMU	DU	MGU	MU	OU
1	Computer Applications (Practical)	*	*	*	-	-	-
2	Information Technology and System Design	*	*	*	-	-	-
3	Computer Basics and Applications	*	*	*	-	-	-
4	IT Applications in Libraries	*	*	*	-	-	-
5	Managing Info. Organisations	-	-	-	*	-	-
6	Info Behavior and Resources	-	-	-	*	-	-
7	Information Technology (Theory)	*	*	*	-	-	-
8	Basic of Information Technology in LIS (Theory)	*	*	*	-	-	-
9	Management in Information Organisations	-	-	-	-	-	*
10	Organisation of Information	-	-	-	-	-	*
11	Information Technology (Practice)-II	*	*	*	-	-	-
12	Big Data Analytics	-	-	-	-	*	-
13	Capstone Projects in Librarianship and Archival Practice: Connecting Information and Communities	-	-	-	-	*	-
14	Basic of Information Technology in LIS (Practical)	*	*	*	-	-	-
15	Information and Communication Technology Applications in LIS (Theory)	*	*	*	-	-	-
16	Information Technology (Practice)	*	*	*	-	-	-
17	Information Technology (Theory)-II	*	*	*	-	-	-
18	Information System Design	-	-	-	*	-	-
19	Information Technology Applications (Practical)	*	*	*	-	-	-
20	Organization of Information	-	-	-	*	-	-
21	Fundamentals of Information Technology	-	-	-	-	-	*
22	Information and Society	-	-	-	-	-	*
23	Digital Curation	-	-	-	-	*	-
24	Information and Communication Technology (Practical)	*	*	*	-	-	-
25	UX Research and Design	-	-	-	-	*	-
26	User-Centered Agile Development	-	-	-	-	*	-
27	Information Seeking and Use	-	-	-	-	-	*
28	Capstone Projects in Librarianship and Archival Practice: Managing and Sustaining Collections	-	-	-	-	*	-
29	Research and Evaluation Methods	-	-	-	-	-	*

'*': Yes, the university is offering the course; '-': No, the university is not offering the course
BHU: Banaras Hindu University, Varanasi; **AMU:** Aligarh Muslim University, Aligarh; **DU:** University of Delhi, Delhi ; **MGU:** McGill University; **MU:** University of Michigan ; **OU:** Oklahoma, University

The above table 3 shows that all selected LIS schools teach ICT practice and theory papers at the master's level. The table represents that 29 ICT courses are included in master's programmes in selected schools. Table 3 also illustrates that all chosen Indian LIS schools include ICT practice and theory courses, although the course names may vary among universities. In comparison, the selected American LIS schools primarily offer practical courses. For example, OU provides courses such as Information and Society and Foundation of Information Technology. While Indian LIS schools also offer core papers related to these topics, they tend to be more theoretical than practical. On the other hand, MU offers six core papers, including design, archival, and digital curation, that specifically focus on practical aspects. Similarly, AMU and DU offer theoretical and practical papers in Information Technology, covering web page design, library automation software, and database creation.

9. Discussions

Selected departments of LIS schools teach ICT-based core papers. However, Indian LIS departments teach ICT practice and theory on a fundamental level. The study found that American LIS curricula are different and more advanced than Indian ones. The similarity is that LIS departments of both countries provide core courses. The courses of both countries are heterogeneous. The selected Indian departments provide similar curricula as ICT practice and theory papers; the study found that American Library schools teach more practical papers, which are also progressive. LIS curriculum in India does not have a strong relationship with the prevailing trends in the field. Conversely, in the United States model, the study found a significant association between the curriculum and trends. This indicates a remarkable connection between the curriculum and the evolving LIS trends in the United States.

10. Conclusion

Indian LIS schools should often update their curriculum to integrate new knowledge, emerging trends, advanced ICT practices, and databases. Harmonising theory and practical courses is crucial, focusing on enhancing competencies through improvised ICT practices and hands-on experiences like workshops and internships. The study highlights the impact of LIS curriculum, schools, and Information Technology on education trends. Information Technology significantly influences LIS education in India and the United States, with a growing shift towards online and blended learning. The use of digital technology is also increasing in Library and Information Science education, emphasising a shift towards Information Science.

References

Aligarh Muslim University. (2022, November 31). Retrieved from https://www.amu.ac.in

American Library Association. (2022, November 30).Retrieved fromhttps://www.ala.org/

Banaras Hindu University. (2022, December 1).Retrieved fromhttps://www.bhu.ac.in/

Biswas, A. (2013). Accreditation of LIS education in India: formation of parameters in the lights of recommendations made by commissions and committees. *Calcutta University Journal of Information Studies (CUJIS),* 15, 145 -156. Retrieved from https://www.researchgate.net/publication/352780607_Accreditation_of_LIS_Education_in_India_Formation_of_Parameters_in_the_light_of_Recommendations_made_by_Commissions_and_Committees

Biswas, A., & Chakrabarti, B. (2014). Place of doctoral research in library and information science: looking back through the

recommendations of commissions and committees in India. *Indian Journal of Library and Information Science,* 8 (3), 253 - 264.

Biswas, A. (2021). History of LIS education in India. Retrieved from https://www.research gate.net/publication/351524079_Chapter_4 _History_of_LIS_Education_in_India

Dali, K., Vannier, C., & Douglass, L. (2020). Reading experience librarianship: working with readers in the 21st century. *Journal of Documentation.* DOI 10.1108/JD-06-2020-01059

Li, K.K. & Chiu, D. (2022). A worldwide quantitative review of the I schools' archivaleducation. *Library Hi Tech,* 40 (5), 1497 - 1518.

Matusiak, K., Stansbury, M. , Barczyk, E. (2014). Educating a new generation of library and information science professionals: a United States perspective. *Library Review,* 82(2), 189-206

Michigan, University. (2022, December 13). Retrieved fromhttps://umich.edu/

McGill University. (2022, December 20). Retrieved fromhttps://www.mcgill.ca/sis/

Oklahoma, University. (2022, December 25). Retrieved from https://www.ou.edu/cas/slis

Richardson, & John V (2010). History of American library science: its origins and early development. *Encyclopedia of library and information science* (3ed.). Doi: 10.108/E-ELIS3-120043738

Satija, M.P. (1999). Doctoral research in library and information science in India: some observations and comments, *Libri,* 49, 236-242.

Saunders, L. (2020). Core knowledge and specialized skills in academic libraries, *College & Research Libraries,* 81(2). DOI:10.5860/crl.81.2.288

Singh, S.P. (2003). Library and information science education in India: issues and trends. *Malaysian Journal of Library and Information Science,* 8(2), 1-17

Swain, N.K (2022). Empowerment through the pedagogy: a case of choice based credit system in library and information science. In K. P. Singh (Ed.), *LIS Education: pragmatic paradigm shift* (pp. 241- 260). New Delhi: Today and Tomorrow's.

The National Assessment and Accreditation Council (NAAC). (2022, November 29).Retrieved from http://www.naac.gov.in/

University of Delhi. (2022, December 5). Retrieved from http://www.du.ac.in

UGC Guidelines: https://ugc.ac.in/pdfnews/ 8023719_Guidelines-for-CBCS.pdf

Yi, K., & Turner, R. (2014). The current landscape of the school librarianship curricula in USA. *Journal of Education for Library and Information Science,* 55(4).

Zain, L. (2017). The Impact of issues in library education worldwide on Indonesian library schools. In: Visakhi, P., Jain, P.K., Kaur, D. C. & Babbar, P. (Eds.). *Dynamics of library for excellence in electronic revolution,* 292-304.

Role of Institutional Repository to Promote the Open Access Policy: a study on central institutional repositories of CSIR, ICAR and DST-DBT

Dr. Ashis Biswas

Librarian, Victoria Institution (College), Kolkata

Abstract

The purpose of the study is to discuss the role of institutional repository (IR) to promote the open access (OA) policy by analysing the OA policy of CSIR, ICAR and DST-DBT and their central IRs. For this study,chiefly thematic analysis with a combination of the inductive and latent approaches has been used.The evidence-based approach and content analysis have also been incorporated to fulfil the stated purpose of this study. It is found that maximum emphasis has been given to setting up of IRs by OA policies. CSIR, ICAR and DST-DBT have published their OA policy where the role of IRs are playing a pivotal role to implement the OA policy. This study presents the iconic relationship between OA policy and IR. In this way, the value of IR has been highlighted to promote the OA policy.

1. Introduction

Institutional repositories play a significant role in the implementation of the OA mandate of the institution by collecting, preserving, and disseminating digital copies of the institution's intellectual output, particularly in research institutions. OA mandates are policies imposed by funders, institutions, or governments that require researchers to publish their research articles open access. It is common for OA knowledge repositories to serve a larger scientific community on a national scale. After that, it is no longer an institutional repository, but a national repository of knowledge. The OA knowledge repositories hosted by India have become one of the most important contributors to the field. According to Open DOAR (www.opendoar.org), India is ranked 16th in the global Directory of OA Repositories in 2023. There are 106 OA IRs registered in India. The majority of these owner institutions are universities, national institutions, laboratories and other research and development centres. Another directory of this kind, maintained by the Registry of Open Access Repositories (ROAR), can be found at http://roar.eprints.org, although its authentication and standardisation are not quite as good. India is ranked 11th in 2023 version of ROAR (Biswas & Das Biswas, 2022).

CSIR is one of the largest scientific research councils in India. A mandate for open access (http://www.csircentral.net/ mandate.pdf) was adopted by the CSIR in 2009 for its 42 laboratories and institutions, the first such mandate in India. In implementing this OA mandate, CSIR institutions will provide OAIRs and a central OAIR for publicly funded research literature.

ICAR has adopted a twelve-point open

access policy (2013) (https://icar.org.in/node/5542) which highlights the establishment of IR as well as other aspects of openly sharing the agricultural knowledge acquired by its institutes. ICAR is pioneering open access (OA) initiatives in India with the creation of KRISHI repository, a central institutional repository (IR).Through the sharing of scholarly content in OA mode, including grey literature, it serves as a knowledge hub in the Indian agricultural field.

DBT and DST launched an open access policy in 2014 (https://dst.gov.in/sites/default/files/APPROVED%20OPEN%20ACCESS%20POLICY-DBT&DST(12.12.2014)_1.pdf) to maximize the dissemination of knowledge and information generated by their funds. In order to ensure that research funds can be accessed, read, and built upon, providing free online access and the best way to preserve them is to deposit them in an institutional repository. A centralised IR hosting service is provided by Science Central for DST-DBT labs, and a harvester service is provided for all DST-DBT institutional repositories.

2. Literature review

The term open access (OA) refers to a publication that is freely available online without charge and with a few restrictions on repurposing. Research that is widely distributed benefits both authors and readers because it reaches more people and enables readers to stay up-to-date with the latest developments (Biswas, Brar, & Bhabal, 2022). Whereas a collection of digital content generated by faculty, staff and students at an institution that is organised and managed is referred to as an IR. A digital repository is designed to gather, manage, preserve, and disseminate intellectual output within and outside of an institution (Das Biswas, & Biswas, 2011; Kalbande, 2012). A number of research and development organisations, leading scientific research institutions (including the Indian Institute of Science, IITs, ISI, CSIR, ICAR, and the Indian Council of Medical Research) are establishing institutional and digital repositories as part of the open access movement to provide access to their research literature worldwide (Bist, & Mohanty, 2006). An important part of the promotion of OA has been initiated through the Delhi Declaration of Open Access (2018) (Banerjee, & Jilani, 2022).The development of OA publishing in India has been boosted by this. INFLIBNET's Shodh Ganga project, a digital repository of Indian theses and dissertations, and e-print archives, such as Eprints@iisc of the Indian Institute of Science, the National Digital Library of India (NDLI), and the Traditional Knowledge Digital Library (TKDL), are among the initiatives. Using ROARMAP (Registry of Open Access Repository Mandates and Policies) data on Indian OA mandates can be useful for determining whether these mandates have been implemented (Rao, & Rao, 2018).Open access initiatives taken by ICAR are also noteworthy (G. Aneeja and Gutam Sridhar, 2009). In 2013, ICAR implemented an open access policy for maintaining its own open access repositories along with establishing a central repository to provide "one-stop access" to all the council's scientific areas (Biswas, 2023). Furthermore, based on statistical analysis, the sciencecentral. in repository of the DST-DBT is also a good central repository in India. (Srichandan, Piryani, Singh, & Bhattacharya, 2020).

The studied literature identifies that there is no such evidence-based study that shows the implication of IRs to promote the OA policy. This study attempts to fill up that gap.

3. Objectives

- To analyse the OA policy to identify the gravity given to IR

- To explore the role of IR to promote the OA policy
- To present case study of central repositories to augment the point of promoting OA policy through setting up IR.

4. Methodology

A combination of inductive (deriving meaning from data without any preconceived notions) and latent (focusing on underlying meanings rather than examining reasons for semantic content) thematic analysis has been used to conduct this study. The evidence-based research approach has also been applied to appraise the role of IR to promote OA policy. For this study, content analysis has been applied as the primary methodology for analysing CSIR, ICAR and DST-DBT repository content. The data collection period was from 1st January 2023 to 28th February 2023.

5. Findings

Table 1: IRs hosted in CSIR Central and their statistics of content submission, download, full text and OA

Sl	IR	Items/ Deposits	Download	Full-Text %	OA %
1	IR@AMPRI > Advanced Materials and Processes Research Institute (AMPRI), Bhopal	763	2580	13	02
2	IR@CECRI >Central Electrochemical Research Institute (CECRI)	2644	219238	97	45
3	IR@CEERI > Central Electronics Engineering Research Institute[CEERI]	430	540	16	12
4	IR@CGCRI > Central Glass and Ceramic Research Institute (CGCRI)	4345	109558	82	06
5	IR@CIMFR > Central Institute of Mining and Fuel Research (CIMFR) Dhanbad	2332	80309	36	06
6	IR@CMERI > Central Mechanical Engineering Research Institute (CMERI)	731	944	14	08
7	IR@IHBT > Institute of Himalayan Bioresource Technology[IHBT]	977	15171	83	11
8	IR@IIIM > Indian Institute of Integrative Medicine (IIIM)	200	432	100	01
9	IR@NEIST > North East Institute of Science and Technology, formerly(RRL) , Jorhat	340	116841	100	100
10	IR@NEERI > CSIR-National Environmental Engineering Research Institute [NEERI]	779	3790	99	14
11	IR@NPL > National Physical Laboratory(NPL)	3816	300709	100	54
12	IR@CLRI > Central Leather Research Institute [CLRI]	05	2327	100	100
13	Indian Theses	506	615	00	00
	Total	**17868**	**853054**	**74**	**24**

(Source: http://csircentral.net/)

Table 1 shows that there are 13 IRs hosted in CSIR Central. Total 17868 items have been deposited of which 853054 times are downloaded, 74% of full text and 24% of OA.

Table 2: Submitted content types in CSIR Central

Sl	IR	Article	Book Chap	Book	Monograph	Conf. or Workshop	Thesis	Patent	Video	Other
1	IR@AMPRI > Advanced Materials and Processes Research Institute (AMPRI), Bhopal	763	00	00	00	00	00	00	00	00
2	IR@CECRI > Central Electro-chemical Research Institute (CECRI)	2252	00	00	09	05	46	332	00	00
3	IR@CEERI > Central Electronics Engineering Research Institute [CEERI]	00	00	00	00	430	00	00	00	00
4	IR@CGCRI > Central Glass and Ceramic Research Institute (CGCRI	3813	29	04	127	194	140	37	00	01
5	IR@CIMFR > Central Institute of Mining and Fuel Research (CIMFR) Dhanbad	2263	25	06	00	35	01	00	02	00
6	IR@CMERI > Central Mechanical Engineering Research Institute (CMERI)	731	00	00	00	00	00	00	00	00
7	IR@IHBT > Institute of Himalayan Bioresource Technology[IHB]	761	00	00	37	00	125	54	00	00

Sl	IR	Article	Book Chap	Book	Monograph	Conf. or Workshop	Thesis	Patent	Video	Other
9	IR@NEIST > North East Institute of Science and Technology, formerly(RRL) , Jorhat	323	3	00	00	14	00	00	00	00
10	IR@NEERI > CSIR-National Environmental Engineering Research Institute [NEERI]	714	30	07	01	16	00	07	00	04
11	IR@NPL > National Physical Laboratory (NPL)	3694	12	04	01	105	00	00	00	00
12	IR@CLRI > Central Leather Research Institute [CLRI]	05	00	00	00	00	00	00	00	00
13	Indian Theses	02	00	00	00	00	504	00	00	00
		15520 (86.86%)	100 (0.56%)	21 (0.12%)	175 (0.98%)	799 (4.47%)	816 (4.57%)	430 (2.41%)	02 (0.01%)	05 (0.03%)
	Total 17868									

Table 2 reveals that CSIR Central is composed mostly of articles (86.86%). Other notable collections are thesis (5.57%) and conference or workshop proceedings (4.47%).

Table 3: Submitted content types in KRSHI according to subject matter division and number of contributors

Content Type	Subject Matter Divisions (SMD) (No. of ICAR Institutes)									
	Agricultural Education (04)	Agricultural Engineering (05)	Agricultural Extension (11)	Animal Science (19)	Crop Science (28)	Fisheries (08)	Horticultural Science (23)	Natural Resource Management (16)	Others (DKMA, ICAR-HQ ...) (02)	Total
Annual Report	123	141	213	221	310	172	217	211	36	1644
Article	570	271	173	1296	1321	8809	1505	1222	13	15180
Audio	01	--	02	26	--	--	23	--	01	53
Biographical	01	--	--	--	--	--	--	--	--	01
Book	52	26	101	128	237	139	187	582	56	1508
Book chapter	68	47	10	147	660	916	327	630		2805
Dataset	--	--	02		01	--	01	02	--	06
Dissertation/ Thesis	95	--	--	--	02	01	05	01	--	104
Editorial Material	04	01	--	03	02	--	--	01	--	11
Extension Leaflet	67	177	145	134	221	353	217	304	--	1618
Image	--	60	15	05	--	--	--	47	--	127
Journal	134	88	18	323	560	184	395	269	76	2047
Learning Object	01	--	--	--	03	01	06	01	--	12
Learning Object	---	---	01	--	---	--	--	--	--	01
Magazine	06	15	07	31	70	12	56	44	04	245
Map	--	--	--	--	--	03	--	27	--	30
Monograph	01	--	01	02	01	--	02	16	--	23
News Items	06	10	06	226	70	05	16	234	01	574
Newsletter	117	227	148	121	368	186	197	337	167	1868
Plan or Blueprint	--	--	02	--	05	--	01	--	--	08
Policy Paper	88	--	--	02	06	13	08	12	02	131
Preprint	01	--	--	--	01	--	--	03	--	05
Presentation	05	02	25	--	86	04	62	490	--	674

Content Type	Subject Matter Divisions (SMD) (No. of ICAR Institutes)									
	Agricultural Education (04)	**Agricultural Engineering (05)**	**Agricultural Extension (11)**	**Animal Science (19)**	**Crop Science (28)**	**Fisheries (08)**	**Horticultural Science (23)**	**Natural Resource Management (16)**	**Others (DKMA, ICAR-HQ ...) (02)**	**Total**
Proceedings	32	09	10	27	220	190	35	--	01	524
Project Report	61	03	06	05	41	01	03	775	--	895
Recording, acoustical	01	--	01	--	01	--	02	--	--	05
Research paper	1785	658	257	1846	4926	3955	3506	6228	44	23205
Review Paper	15	27	06	36	83	21	60	59	--	307
Software	01	--	--	02	01	--	--	02	02	08
Software Code or Macro	50	--	--	--	--	01	--	02	--	53
Success Story	01	14	15	07	21	01	21	32	01	113
Technical Bulletin	94	94	69	117	840	81	212	1948	33	3488
Technical Report	27	14	32	21	44	47	46	2930	17	3178
Training Manual	38	06	06	31	130	174	33	125	--	543
Video	12	05	29	26	08	10	43	49	--	182
Vision Document	08	11	03	09	18	05	23	17	03	97
Working Paper	07	--	--	--	04	--	01	07	--	19
Other	137	65	67	59	424	582	318	1116	104	2872
Total	**3609**	**1971**	**1370**	**4851**	**10685**	**15866**	**7528**	**17723**	**561**	**64164**

(Source: https://krishi.icar.gov.in/jspui/)

Table 4: Availability of full text and OA content in KRISHI repository

Sl	KRISHI Content	Deposits	Full- text %	OA%
1	Research paper	23205	04	02
2	Article	15180	12	11
3	Journal	2047	10	10
4	Book chapter	2805	03	02
5	Book	1508	05	03
6	All other contents	19419	94	91
Total		**64164**	**33**	**31**

Table 3 and table 4 bring forth the coverage of resources of KRISHI repository. It is found from research papers to different kinds of grey literature have been deposited in the repository. 33% is full-text and 31% is OA of total 64164 contents.

Table 5: IRs hosted in Science Central of DST-DBT and their statistics of content submission, download, full text and OA

Sl	IR	Items/ Deposits	Download	Full-Text %	OA %
1	IR@DBT > Department of Biotechnology (DBT)	00	00	00	00
2	IR@CDFD > Centre for DNA Fingerprinting and Diagnostics (CDFD)	984	9331	99	37
3	IR@CIAB > Center of Innovative and Applied Bioprocessing (CIAB) Mohali	02	00	100	00
4	IR@NBRC > National Brain Research Centre	742	2285	82	29
5	IR@NIBMG > National Institute of Biomedical Genomics (NIBMG)	10	00	00	00
6	IR@THSTI > Translational Health Science and Technology Institute (THSTI)	09	00	00	00
7	IR@BIRAC > Biotechnology Industry Research Assistance Council (BIRAC)	00	00	00	00
8	IR@DST > Department of Science and Technology	21	2481	57	57
9	IR@ILS > Institute of Life Sciences (ILS)	10	00	00	00
10	IR@NCCS> National Centre for Cell Science (NCCS)	1895	1970	29	19
11	IR@RCB > Regional Centre for Biotechnology (RCB)	631	692	59	41
12	IR@WELLCOMEDBT >Wellcome Trust/DBT	00	00	00	00
13	IR@BIBCOL > Bharat Immunologicals and Biologicals Corporation Limited (BIBCOL)	00	00	00	00

Sl	IR	Items/ Deposits	Download	Full-Text %	OA %
14	IR@IBSD > Institute of Bioresources and Sustainable Development	10	00	00	00
15	IR@NABI > National Agri-Food Bitechnology Institute(NABI)	2001	2099	80	72
16	IR@NIAB > National Institute of Animal Biotechnology (NIAB)	1756	2006	80	85
17	IR@RGCB >Rajib Gandhi Centre for Biotechnology (RGCB)	945	84	99	04
		9016	**20948**	**72**	**82**

(Source: http://sciencecentral.in/)

Table 5 shows that there are 17 IRs hosted in Science Central. Total of 9016 items have been deposited of which 20948 times are downloaded, 72% of full text and 82% of OA.

Table 6: Submitted content types in Science Central of DST-DBT

Sl	IR	Article	Book Chap	Book	Monograph	Conf. or Workshop	Thesis	Patent	Video	Other	Total
1	IR@DBT > Department of Biotechnology (DBT)	0	0	0	0	0	0	0	0	0	0
2	IR@CDFD > Centre for DNA Fingerprinting and Diagnostics (CDFD)	975	05	0	0	04	0	0	0	0	984
3	IR@CIAB > Center of Innovative and Applied Bioprocessing (CIAB) Mohali	02	0	0	0	0	0	0	0	0	02
4	IR@NBRC > National Brain Research Centre	718	20	02	0	01	0	0	0	01	742
5	IR@NIBMG > National Institute of Biomedical Genomics (NIBMG)	10	0	0	0	0	0	0	0	0	10
6	IR@THSTI > Translational Health Science and Technology Institute (THSTI)	09	0	0	0	0	0	0	0	0	09
7	IR@BIRAC > Biotechnology Industry Research Assistance Council (BIRAC)	0	0	0	0	0	0	0	0	0	0

Sl	IR	Article	Book Chap	Book	Monograph	Conf. or Workshop	Thesis	Patent	Video	Other	Total
8	IR@DST > Department of Science and Technology	20	0	0	01	0	0	0	0	0	21
9	IR@ILS > Institute of Life Sciences (ILS)	10	0	0	0	0	0	0	0	0	10
10	IR@NCCS> National Centre for Cell Science (NCCS)	1792	102	0	0	0	0	0	0	01	1895
11	IR@RCB > Regional Centre for Biotechnology (RCB)	624	5	0	1	0	0	0	0	1	631
12	IR@WELLCOMEDBT >Wellcome Trust/DBT	0	0	0	0	0	0	0	0	0	0
13	IR@BIBCOL > Bharat Immunologicals and Biologicals Corporation Limited (BIBCOL)	0	0	0	0	0	0	0	0	0	0
14	IR@IBSD > Institute of Bioresources and Sustainable Development	10	0	0	0	0	0	0	0	0	10
15	IR@NABI > National Agri-Food Bitechnology Institute (NABI)	2001	0	0	0	0	0	0	0	0	2001
16	IR@NIAB > National Institute of Animal Biotechnology (NIAB)	1753	03	0	0	0	0	0	0	0	1756
17	IR@RGCB >Rajib Gandhi Centre for Biotechnology (RGCB)	945	0	0	0	0	0	0	00	0	945
		8869 (98.37%)	**135 (1.50%)**	**02**	**02**	**05**	**00**	**00**	**00**	**03**	**9016**

Table 6 reveals that Science Central is also composed mostly of articles (98.37%). Another notable collection is book chapter (1.50%).

Table 7: Comparison of CSIR Central, KRISHI and Science Central

Sl.	Repository	Items	Downloads	Full text (%)	OA (%)
1	CSIR Central	16564	850955	74	24
2	ICAR KRISHI	64164	4159923	33	31
3	DST-DBT Science Central	9016	20948	72	82

Table 7 presents a comparison among CSIR Central, KRISHI and Science Central. It is found that because of the large content submission, number of downloads from KRISHI repository is in a good place. On the other hand, despite of 72% full-text and 82% OA, the number of downloads from Science Central is not very good. One of the reasons is only 9016 items have been deposited.

6. Discussion

6.1 CSIR Central

The OA policy of CSIR composed of seven points emphasises on the setting up of IR. The first, second, and fourth points focus exclusively on the setting up of their own IRs along with a central repository for research papers, electronic theses, and dissertations that helps harvest the full-text and metadata of these documents.

There are 13 IRs (vide table no. 1) hosted in CSIR Central. Other twenty CSIR institutes have their IRs also. In CSIR Central, article (15520), book chap (100), book (21), monograph (175), conference or workshop (799), thesis (816), patent (430), video 02) and other contents (05) have been deposited. A total of 17868 documents have been deposited in CSIR Central. 74% of them are full-text and 24% of them are OA. The downloading statistics is 853054.

6.2 ICAR KRISHI

The very first point of ICAR's OA policy emphasises the establishment of IR for each of its institutes. It has been observed that out of 65 ICAR research institutes; 15 ICAR-national research centres; 3 central agricultural universities and 4 deemed universities, 4 ICAR research institutes, viz., Central Marine Fisheries Research Institute, Kochi; ICAR-Central Plantation Crops Research Institute, Kasargod; ICAR-Central Potato Research Institute, Shimla; Indian Institute of Rice Research, Hyderabad and one national research centre, viz., National Research Centre on Meat, Hyderabad have opened individual OAIR so far.

Whereas the second point buckles down to the need for central repository. In order to make its knowledge resources available to all stakeholders at one point, ICAR has developed a central OAIR called KRISHI - Knowledge Based Resources Information Systems Hub for Innovations in Agriculture.

ICAR's fourth point focuses on making all publications open access. The publications of five ICAR institutes are submitted through their respective institutional repositories, and the publications of others are submitted directly to the KRISHI repository. According to table 3, ICAR institutes have deposited research papers to the grey literature in KRISHI. First and second place respectively go to research papers and articles.

It is also recommended that unpublished ICAR documents be deposited in an OA

repository in the fifth point. In addition, the institutions have begun sharing unpublished reports in their institutional repositories or directly in KRISHI repository which is shown in table 3. The said table also shows that 05 pre-print have been submitted so far which has been highlighted in point number six.

In the seventh point, ICAR scientists and researchers are encouraged to publish with publishers who offer self-archiving via OAIR. According to data taken from the ICAR - National Agricultural Science Fund (NASF) website (https://www.icar.gov.in/nasf/index.html), 110 articles related to 15 ICAR funded projects have been published in 80 journals under Call I phase. It has been reported that 57 of those 80 journals publish their articles in open access mode which also allows self-archiving. A total of 09 of them are ICAR published journals offering Open Access, while another 02 are ICAR published journals offering hybrid access and they are connected to KRISHI repository.

In connection with point number 7, point number 8 also emphasises that ICAR funded researchers' final manuscripts have to be submitted in OAIR. It is found that more than 50% of publications have been published as open access. Among them, 11% of OA article is available through KRISHI repository (vide Call I phase).

Table 3 also connects point number ten which focuses on the submission of dissertation/Ph.D. thesis by presenting 104 M.Sc. and Ph.D. thesis/dissertations (full content) in KRISHI. Among them, Agricultural Education stands in the first position with 95 thesis/dissertations.

In accordance with the last or 12th point of ICAR's OAP, documents with patent able or commercially viable materials are not allowed to be submitted in OAIR. Researchers and staff at ICAR can however negotiate with publishers to share commercial books via institutional repositories after a reasonable embargo period. As of today, ICAR holds 654 patents in the field of agriculture (https://krishi.icar.gov.in/icaripdb/patent-list/168).

6.3 DST-DBT Science Central

Two third portion of DST-DBT OA policy has focussed on setting up of IR. A central harvester (www.sciencecentral.in) has been established by the Ministry of Science and Technology to harvest full texts and metadata of OA publications. It is recommended that all other institutions have an IR. Publications from institutions without IRs can be deposited into the central repositories maintained by DBT and DST. Sciencecentral.in is the main domain under which each laboratory's IR is created. A single console for searching and viewing R&D literature from different DST-DBT institutes is provided as a value-added service for the research community. Science Central hosts 17 institutional repositories, while 42 other repositories are regularly harvested. In Science Central, article (8869), book chapter (135), book (02), monograph (02), conference or workshop (05), thesis (00), patent (00), video(00) and other contents (03) have been deposited. A total of 9016 documents have been deposited in CSIR Central. 72% of them are full-text and 82% of them are OA. The downloading statistics are 20948.

6.4 Comparison

A comparison of three central repositories shows that ICAR's KRISHI has large scope and coverage regarding items and downloads. On the other hand, CSIR Centralis providing a good number of full text (74%). But both ICAR and CSIR Central are

providing open access content below 35%. Whereas the availability of OA content in DST-DBT Science Central is in a good position with 82%. But the content of Science Central only includes 9016 items. Therefore, the overall comparison of the three central repositories explores that ICAR's KRISHI is in a good position.

6.5 Epitomisation

The overall analysis of the OA policy of CSIR, ICAR and DST-DBT shows that maximum emphasis has been given to setting up IR to accomplish the OA policy. While the creation of central repositories is an effective initiative to harness the motto of OA policy. The case studies of central repositories of CSIR, ICAR and DST-DBT have explored in this study how they are playinga pivotal role as the main instrument to implement the OA policy. The central repositories have functioned as one-stop access to the full-text, abstract and metadata of scholarly content. Even the repositories have provided good facilities to share the unpublished or grey literature of the institutions to all. It not only enhances the OA movement but also enriches the knowledge domain. Moreover, the usage of this literature is maximised because of availability in OA mode through IR. It is very much noticeable in the KRISHI repository. The self-archiving policy which is another crucial part of OA policy also gets instrumental through IR. The fact has also been identified in the said three central repositories.

7. Conclusion

To accelerate the OA movement, OA policy plays a crucial role by framing the proper guideline. But OA policy should not be a mere guideline. Constructive steps have also to be taken to implement the OA policy properly. Setting up IRs is one of the important steps to do that. The central repositories of CSIR, ICAR and DST-DBT have already shown the crucial role IR is playing to promote the OA policy. The role of IR needs to be made more vital by making more content available in full-text and OA modes. Finally, it can be concluded that IR is the main pillar for the successful implementation of OA policy.

References

Aneeja, G., & Sridhar, G. (2009). Prospects of open access to Indian agricultural research: a case study of ICAR. *First Monday,* 14(7).

Bist, R. S., & Mohanty, V. P. (2006). Open access movement and open access initiatives in India. *4th Convention PLANNER -2006,* Mizoram Univ., Aizawl, 09-10 November, 2006.

Biswas, A. (2023). KRISHI publication and data inventory repository: an evaluative study. 2023. In Kar, Debal C., Khan, Shams Z., Durrany, Abida & Jain, P. K. (Eds.), *New and Innovative Libraries in Digital Era: services and practices* (pp. 307 - 316). Delhi: Bookwell.

Biswas, A., & Das Biswas, M., (Eds). (2022). *Panorama of open access: progress, practices and prospects.* New Delhi: Ess Ess Publications.

Biswas, A., Brar, K. S., & Bhabal, J. (2022). Open Access: ushering in new dimension to information services. In Biswas, Ashis & Das Biswas, Mayuri (Eds.), *Panorama of open access: progress, practices and prospects* (pp. 3 -23). New Delhi: Ess Ess Publications.

Das Biswas, M., & Biswas, A. (June, 2011). Institutional repository: a case study of India. *International Conference on Digital Library Management (ICDLM).* Science City, Kolkata, June 2011.

Rao, S. S., & Rao, N. L. (2018). Open access policies and mandates: a study of their implementation in academic institutions in India. *IFLA WLIC 2018.* Kualalumpur.

Srichandan, S. S., Piryani, R., Singh, V. K., & Bhattacharya, S. (2020). The status and patterns of open access in research output of most productive Indian institutions. *Journal of Scientometric,* 9(2), 96-110.

Websites:

CSIR Central. Retrieved from http://csircentral.net/ (01.01.2023 - 28.02.2023)

CSIR Open Access Mandate. (2009). Retrieved from http://www.csircentral.net/mandate.pdf

DST-DBT Open Access Policy. (2014). Retrieved from https://dst.gov.in/sites/default/files/APPROVED%20OPEN%20ACCESS%20POLICY-DBT&DST(12.12.2014)_1.pdf

ICAR - National Agricultural Science Fund (NASF). https://www.icar.gov.in/nasf/index.html (01.01. 2023 - 28.02.2023)

ICAR Open Access Policy. (2013). Retrieved from https://icar.org.in/node/5542

ICAR. https://icar.org.in/ (01.01.2023 - 28.02.2023)

ICAR-IPR Repository. https://krishi.icar.gov.in/icaripdb/ (01.01.2023 - 28.02.2023)

Indian Agricultural Research Journals. https://epubs.icar.org.in/ (01.01.2023 - 28.02.2023)

KRISHI. https://krishi.icar.gov.in/jspui/ (01.01.2023 - 28.02.2023)

Science Central. Retrieved from http://sciencecentral.in/ (01.01.2023 - 28.02.2023)

An Assessment of E-Resources and Information Utilisation in National Law Universities of East India: a study

Shivjee Prasad

Research Scholar, Desh Bhagat University, Mandi Gobindgarh Punjab

Dr. Payare Lal

Professor, Department of Library and Information Science, Desh Bhagat University, Mandi Gobindgarh Punjab

Abstract

In the twenty-first century, most legal academics preferred e-resources to e-journals, e-judgments, e-books, and legal databases because of their breadth, extensive indexing and analytical content, and rapid updates. To compete for and succeed in most law careers, law students must be proficient users of these databases. Scholars can benefit from print resources and less advanced internet technologies. Locating useful information in a timely manner is critical for both researchers and information professionals. The new and current trend in library services is to access library collections electronically for economic and user-friendly reasons. Library professionals believe that electronic information plays an important role in providing users with up-to-date information in a timely manner.The goal of this study is to learn about the use of electronic resources and information at India's National Law University. The research's primary goal is to learn about the availability and use of electronic resources, services, and facilities in national law university libraries. According to the study's findings, library staff should assist students in locating electronic resources and information on their own. It is proposed that law libraries embrace the practice of soliciting user input to improve their facilities and services, which will undoubtedly contribute to the strength of the library's services.

Keywords: Academic libraries, E-resources and information, Law Universities, Legal databases

1. Introduction

Libraries especially academic libraries have extended their scope and coverage to sustain their status as the heart of the institution (Biswas, 2022). Academic libraries have amassed collections of print and electronic resources and made them available to their user communities, which primarily include faculty and students. A visit to a law library can benefit anyone interested in the current state of the law, including law students, attorneys, judges, and their representatives. Due to the unique services, they provide and the specific demographics of their patrons, law libraries are classified as "special libraries" in the library world. There are several law libraries around the world, either as a section of a larger library or as a separate law library. In recent years, online legal research tools such as SCC Online, Westlaw, Lexis Nexis, Indian Kanoon, and

Manupatra have reduced the need for print books such as reports and legislative compilations. Because so much legal information is now available online, some law libraries have reduced their print holdings while expanding their internet access. The term "electronic tools" has been broadly defined as computer-accessible content that may be useful as bibliographic guides to potential sources, but it is uncommon for them to be cited as a reference in their own right (Graham, 2003). In addition, electronic resources are computerised position records made available to library users through a PC-based information recovery framework. Electronic resources have become a source of information due to their effective presentation using multimedia tools. Electronic tools appear on the Web in a variety of flavours and categories.

Some of the key issues that the librarian must address in order for its clients to make the best use of it are a periodic evaluation of online e-resources and careful evaluation of the e-journal standard before placing orders. Periodic research can also be used to build an efficient e-learning environment in order to cut costs and improve the efficiency of electronic information services. This will provide the impetus needed for information professionals to establish appropriate expectations and approaches for supporting e-learning in libraries. Rowley (2006) distinguishes two types of electronic journals: those that are also printed and distributed digitally, and those that do not require a publisher and are managed by an editor and the academic community. Both may have far-reaching implications for academic knowledge production and exchange processes. E-Journals are valuable resource for academic, research, and development purposes.

Electronic journals have several advantages, including their ease of use, "anywhere, anytime" accessibility, shareability, hyperlink capability to related texts, cost-effectiveness, and elimination of the storage problem encountered with print journals. Many Open-Source E-Journals can also be found on the Internet. However, no comprehensive study of the depth of such e-resources in university libraries has been undertaken until now. Nonetheless, on a limited scale, the use of e-resources in UP universities has recently emerged with some interesting findings and useful recommendations that will undoubtedly promote modified e-services in university libraries in the days ahead.

2. Literature review

Coordinating instruction for academic library and e-resources pose many challenges when trying to project needs into the future (Biswas, Nausheen and Chakrabarti, 2011). Proper assessment and utilisation of e-resources in academic libraries explore the future trend of library resources and services. Using the resources available at the Madurai District Court Library, Padma and Ramasamy (2017) investigated the habits of the most inquisitive lawyers. It was found that the vast majority of attorneys, 46.09 percent (70) of those polled, focused on civil cases, while 40.79 percent (62) focused on criminal cases. Junior lawyers made up 41.45% of the total, while Senior lawyers made up 28.19%. There were 19 (12.50%) responses with 16 to 20 years of experience.

Nwabueze and Urhiewhu investigated access to and utilisation of modern information resources among Nigeria's tertiary-educated population in Delta and Edo states (2015). According to their research, digital information resources are primarily housed in the libraries of Delta and Edo State

Universities. In addition to an unstable power supply, insufficient computers, insufficient bandwidth, organisational challenges, and a lack of access to digital information resources, the investigation discovered that all university libraries lacked a formal online to use digital information resources. Alam (2014) emphasised the impact of ICT on the format of information products as well as the delivery method of legal information resources. The Montreal Declaration is the result of the open access movement's influence on the law. The Free Access to Law Movement (FALM) has helped to establish lawful information institutions (LIIs) around the world. The FALM's contribution from the Universities of National Law is the Indian Legal Information Institute.

Many open access materials are popular in India's legal community, according to Bhardwaj and Madhusudan (2013). The majority of respondents are aware of open access resources, according to the study's findings. The primary reason for using those resources is to research case law. The majority of respondents stated that the legal content available on open access sites is disorganised and thus difficult to use. Mandal (2012) investigated the challenges confronting special libraries, the importance of knowledge management, and the role of library information professionals, as well as the critical abilities and staff skills required for the profession to thrive in the digital age. The next generation of e-learning, is expected to aid similar future developments by utilising mobile technology and libraries. Parvez (2011) emphasised the importance of ICT in libraries and outlines the benefits of ICT-based library operations and services.

Law is a highly specialised and technical subject; it is a living discipline that changes on a daily basis. Law, by definition, is complicated and ever-expanding. Legal knowledge is essential for everyone, including attorneys and non-lawyers. Ayua (2001) defined legitimate research as the formation or elaboration of lawful doctrine and the standardisation of objects of law through the use of resources such as rules, legislation, decisions, and instances. Legal literature, such as law books, law reports, laws and regulations, legal journals, government documents, reference materials, and other interrelated unpublished works of law, could thus be referred to as legal information services, as could non-legal books, such as conference papers, e-resources, law theses, and so on. The law library system is where all of humanity's documented knowledge in the form of legal materials (print and electronic) is preserved for posterity. Legal professionals, scholars, researchers, teachers, and students can all find useful resources at Deakin University Australia's law library (2014).

It is worth noting the current level of internet access to legal services. Lexis Nexis and Westlaw provide access to a wide range of legal resources, such as case law, statutes, and administrative agency decisions and filings. Many other commercial and public websites, on the other hand, provide access to legal materials (Todd 2007; Makri 2008). Legal libraries are transitioning from traditional manual assistance to an electronic conveyance framework via Internet connection to PC workstation systems, which provides more appealing and effective administration conveyance.

3. E-resources

E-journals, E-books, CDs / DVDs, E-meeting protocols, E-Reports, E-Maps, E-Manuscripts, E-Pictures / Photographs, E-Newspaper, E-Theses, Newsgroups, Topic Gateways, Listservs, FAQs, USENET, and so on. "These can be disseminated on CD-ROM / DVD, through the Internet, and so on. Access

to e-resources is a service that assists library users in exploring e-Databases, e-Journals, e-Magazines, e-Books / e-Audio / e-Images, Data / GIS, Digital Library Projects, Electronic Exhibitions, e-Subject Guide, e-Newsletters, E-Meeting Procedures, and point-scale Web search tools". They do not need to emphasise information authorisation and use. Ibid, e-resource retrieval is easier than print resource retrieval. Anyone, from anywhere, may access each database. The application can assist users in retrieving the best information; nonetheless, it is only somewhat transitional.

4. Objectives of the study

The following are main objectives of this research:

- to learn about the use of electronic resources and information at the National Law Universities of EastIndia
- to learn about how the availability and utilisation of e-resources in National Law Universities impact the overall legal education system
- to explore how users can be assisted in locating resources and information on their own.

5. Methodology

The goal of this study is to investigate initiative, electronic journal use, performance, and influence in various higher education institutions. Users of Law Universities of East India will provide primary data in the form of five-point scale comments. To study the utilisation of e-journals, a basic statistical analysis employing a weighted mean was performed. The majority of the study relies on original data gathered from Law Universities via a well-designed questionnaire. For the data collection, 50 students (male and female) from each national law university in East India were recruited. Questionnaires were provided to PG students and research scientists, with 70% of them returned, resulting in a 70% response rate. This research is limited to the education college. Its geographic range is restricted to East India.

6. Collection of resources

Law University Libraries have a variety of resources in many formats such as online resources, open sources, online books, journals both online and print, magazines, newspapers, and open education, as well as being linked to INFLIBNET e-content.

Library services are: web OPAC , about web OPAC , subject ordering by bays, remote access, DELNET inter-library loan, DELNET document delivery services, digital knowledge centre, new arrival services, newspaper clippings services and reference services.

7. National Law Universities (NLU) in East India

The National Law School of India University, India's first independent law school, was founded in Bangalore to implement legal education reforms. Several national law schools were established in other states in response to the NLS concept. The institutes have been designated as "state universities" by the University Grants Commission and are affiliated with the Indian Bar Council.

Table 1: National Law Universities (NLU) in East India

Sl.	Name of the East NLU of India	Abbrv.	Estd.	City	State
1	Chanakya National Law University	CNLU	2006	Patna	Bihar
2	Hidayatullah National Law University	HNLU	2003	Raipur	Chhattisgarh
3	National Law University and Judicial Academy	NLUJA	2009	Assam	Guwahati
4	National Law University	NLUO	2009	Cuttack	Odisha
5	National University of Study and Research in Law	NUSRL	2010	Ranchi	Jharkhand
6	The WB National University of Juridical Sciences	WBNUJS	1999	Kolkata	West Bengal

Each of these law universities was established in accordance with a separate statute passed by the state legislature to establish a law school in the concerned states. The Bar Council of India has collaborated with various esteemed and gifted individuals with such law schools, for example, the Chief Justice of India or the Chief Justice of the High Courts as 'guests' or 'chancellors' of the national law schools, to improve the quality of legitimate education and to ensure that the education provided in these institutions satisfies the guidelines required.

8. Findings

Table 2: Respondents'profile

Sl. No.	Category	No. of respondents	%
1.	PG Students	99	56.57
2.	Research Scholars	76	43.43
Total		**175**	**100**

Table 2 shows the profiles of the respondents. Most of the 175 people who answered are PG students. 56.57% of students and 43.43% of students are Research Scholars.

Table 3: Regularity of utilisation of electronic journals in library

Sl.No	Frequency	No. of respondents	%
1.	Every day	65	37.14
2.	Once a week	35	20
3.	Once a fortnight	30	17.14
4.	Once a month	25	14.29
5.	Rarely	20	11.43
Total		**175**	100

Table 3 shows the frequency with which library patrons use electronic journals. According to the survey, 37.14% of participants use e-journals daily, 35.0% weekly, 17.14% bi-weekly, and 14.29% monthly. Only one respondent occasionally used e-journals; otherwise, she preferred print materials.

Table 4: Utilisation of ICT products and services

Sl. No	Most frequently used journals	No. of respondents	Percentage
1.	Open Access Journals	45	25.71
2.	Subscribed E-Journals	20	11.43
3.	N-List E-Journals	45	25.71
4.	Articles from Internet	65	37.14
Total		**175**	100

Table 4 depicts how users use ICT products and services. The respondents (25%) use open access journals such as SAGE E-Journals, with 25.75% using N-LISTe-journals, 20% using subscribed journals, and 37.14% using internet articles.

Table 5: Persistence of utilisation of e-journals

Sl. No.	Purpose	No. of respondents	Percentage
1.	For doing research	41	23.43
2.	For fulfilling academic works	44	25.14
3.	For writing articles	55	31.43
4.	For gathering knowledge	35	20.00
Total		**175**	100

Table 5 reveals the reason for using e-journals at the library. The respondents (31.43%) use e-journals for research, while 25.14% use them to complete academic assignments. Only 20% of respondents use it to expand their knowledge, while 23.43% use it to write articles.

Table 6: Impediments in accessing the e-journals

Sl. No	Limitation	No. of respondents	Percentage
1.	Information Overflow	51	29.14
2.	No Authoritative Information	34	19.43
3.	Password Access	49	28.00
4.	Lack of information retrieval skill	41	23.43
	Total	**175**	100.00

Table 6 depicts the library's restrictions on e-journal access. 29.14% of those who responded said that there is too much information, 19.43% said there is no authoritative information, 28% said password access is the main barrier to accessing e-Journals, and 23.43% said they lack information retrieval skills.

Table 7: Appropriate approach to utilising e-journals

Sl.No	Convenient mode	No. of respondents	Percentage
1.	Downloading to storage device	65	37.14
2.	Reading on computer screen	55	31.43
3.	Taking print out	55	31.43
Total		**175**	100

Table 7 depicts the most convenient method for library users to access e-journals. The majority of users (37.14%) preferred downloading the articles to personal storage devices such as pen drives, while 31.43% preferred reading the articles on a computer screen and 31.34% printed them.

9. Discussion

- 37.14% use e-journals every day, 35 percent use them once a week, 17.14 percent use them once a fortnight, and just 14.29% use them once a month.
- Subscribed e-journals (SAGE E-Journals), are followed by 25.75% using N-LIST e-journals, 20% using open access journals, and just 37.14% utilising internet articles.
- 29.14% of those who answered said that too much information is the main problem, followed by 19.43% who concluded that there is no authoritative information, 28% who stated that password access is the main barrier to accessing e-journals, and only 23.43% who agreed that they lack information retrieval skill.
- The users (37.14%) preferred downloading the articles to personal storage devices such as pen drives, while 31.43% preferred reading on a computer screen and just 31.34% printed the articles.

10. Conclusion

Students, scholars, and academic library personnel benefit from the use of e-journals (both open access and subscription) and online databases. Nowadays, electronic formats, particularly e-journals and online databases, are used to publish the vast majority of information. According to the study's findings, some users are unaware of e-resources. Librarians may offer orientation programmes on a regular basis to help users gather information more efficiently. This type of orientation session will help users become acquainted with e-resources and new library arrivals. According to the study's findings, library staff should assist students in locating electronic resources and information on their own. It is proposed that law libraries embrace the practice of soliciting user input to improve the facilities and services, which will undoubtedly contribute to the strength of the library's services.

References

Ayua, I. (2001). Information technology and legal practice. Paper presented at the *10th Advanced Course in Practice and Procedure held at the Nigerian Institute of Advanced Legal Studies,* University of Lagos Campus. 20.

Bhardwaj, R. K., & Madhusudhan, M. (2013). Open access legal information sources and their use by students of National Law University. *Annals of Library and Information Studies,* 60 (4), 314-319.

Biswas, A. (2022). Transformation of academic libraries from service providers to academic partners. In *Changing Scenario of Academic Library during Post-Pandemic Times : Challenges and Opportunities* (pp. 36 - 45). Kolkata: RKMC. Retrieved from https://www.researchgate.net/publication/371109565_Transformation_of_Academic_Libraries_from_Service_Providers_to_Academic_Partners

Biswas, A., Nausheen, S., & Chakrabarti, B. (2011). *An introduction to library management.* Kolkata: Progressive Publishers. p. 53.

Deakin University Australia. (2014). Legal principles and skills students. Retrieved from http://deakin.libguides.com/law

Dina, Y., Akintayo, J. O., & Ekundayo, F. (2013). Hauser global law school programme: Globalex- update- guide to Nigerian legal information. Retrieved from http://www.nyulawglobal.org/Globalex/Nigeria1.htm

GRAHAM (S R) (2003). Historians and electronics resources: a citation analysis. *JAHC,* 3 (3), 18-24.

Kenny, G. J.,& Qiang, C. Z. (2004). *Information and communication technologies and broad- based development: a partial review of the evidence.* Washington, D. C: The World: The World Bank.

Makri, S., Blandford, A., & Cox, A.L. (2006). *Studying law students information seeking behaviour to inform design of digital law libraries.* Retrieved from www.uclic.ucl.ac.uk/events/dl- cuba2006/papers/makri/pdf

Mandal, B.R.,Podder, A. K., & Choudhuri, B.C. (2012). Building Knowledge Management System: the key to Special libraries renaissance at the digital era. In *Challenges in Library Management System,* 24, p. 369.

Nwabueze, A. U.,& Lucky O. Urhiewhu (2015). Availability and use of digital information resources by undergraduates of university in delta and 334 Edo States, Nigeria. *International Journal of Digital Library Services,* 5 (2), 1-12.

Okello Obura, C. (1998). *Legal information sources.* Unpublished Master of Science in Information Science report, Makerere University.

Otike, J. (1997). Legal information needs of the general public. *Library Review,* 46(1), 28-33.

Padma, P., Ramasamy, K., & Selvam, K.P. (2015). *Digital information seeking behaviour of lawyers of Madurai.* Chennai: SALIS. p.226-238.

Parvez, A. (2011). Development in library services with the advent of ICT based products and services: a continuous process. *International Journal of Digital Library Services,* 1 (2), 1-9

The Law Library of Congress (2014). *Guide to Secondary Legal Resources.* Retrieved from http://www.loc.gov/law/help/secondary-rsrcs.php

Todd, K.M. (2007). Lawyers need more than an electronic library. *Legal Times* (July 10).

Content Analysis of Library Webpages of NAAC Accredited "A" Grade Colleges under West Bengal State University: a study

Manas Saha

Librarian, Sree Chaitanya Mahavidyalaya, Habra-Prafullanagar, West bengal

Shibananda Mridha*

Librarian, Sree Chaitanya Mahavidyalaya, Habra-Prafullanagar, West Bengal

(*Corresponding Author)

Abstract

A library webpage is a vital platform to disseminate and integrate the respective library resources and services to meet the users' needs. The principal objectives of this research work are to examine the accuracy and comprehensiveness as well as accessibility and user friendliness of the library webpage, which are totally based on its resources, facilities, and services. The data have been accumulated through searching, browsing, and analysing the eight NAAC accredited "A" grade college websites and respective library webpages between July 2022 and October 2022 with the help of a well-structured checklist based on an earlier study conducted by different experts. Most of the library webpages are static in nature and provide inadequate information about their resources and services in a scattered way. No library ranked in the "excellent" category, but most of the college libraries secured either the "very good" or "good" category. The information about frequently asked questions (FAQ) is totally absent, as are the very few library webpages that provide information on study materials, rare books, etc., which are very useful for library users. So, this research work will certainly help the library and information science (LIS) professional and college authorities to upgrade their existing library webpages as well as to develop and design new library webpages.

Keywords: College website, Content analysis, Library resources, Library webpages, NAAC, West Bengal State University

1. Introduction

A library webpage is considered a virtual mirror of the library's resources and services for the users of the respective educational institution. It is accessible via the network through at least one web server. The network may operate via internet or a private local area network. The educator uses these sites both for their professional development and as a teaching tool. A strong and solid connection has been developed with the users through the library webpage by promoting the availability of different library facilities, services, and resources. Hence, for the sake of a credible relationship between users and the resources of the library, the LIS professionals must be considered in developing a very efficient library webpage so that every user can know

the library at a glance as well as feel the effectiveness of web-based services (Kuri &Maranna, 2018). The main objective of this research work is to guide LIS professionals in designing and developing a new efficient, effective, and user-friendly library webpage as well as improving the existing library webpage.

2. Brief Information of the selected colleges:

In this research work, we considered colleges affiliated with WBSU, and every selected college was awarded an "A" grade or above in their last NAAC cycle. From the observation of all the college websites, it is revealed that only 8 colleges are able to obtain an "A" grade out of 46 general degree colleges affiliated with WBSU, and no one obtained an "A" grade above. So, our study is confined to these eight colleges, and a brief description of each college is given below.

2.1 Acharya Prafulla Chandra College (APC)

Acharya Prafulla Chandra College (APC), formally known as New Barrackpore College, was established on August 16th, 1960, by Late Haripada Biswas. This college was awarded an "A" Grade by NAAC in the 2nd cycle of accreditation on December 2, 2016.

2.2 Barasat Government College (BGOVTC)

In 1950, Barasat Government School was established by the West Bengal Government for offering intermediate, i.e., 12th standard, in the arts stream affiliated with Calcutta University. It was upgraded in 1956 to Degree College. This college faced the second cycle of NAAC on January 19, 2016 and was awarded an "A" Grade by the NAAC Authority.

2.3 Bhairab Ganguly College (BGC)

This co-educated government-aided degree college, affiliated to WBSU, was established on January 3, 1968. On May 25, 2016, this college was awarded an "A" Grade by the NAAC Authority in its 2nd cycle situation.

2.4 Gobardanga Hindu College (GHC)

Gobardanga Hindu College (GHC) is a government-sponsored co-educational degree college affiliated to WBSU established in a semi-urban area at Gobardanga on November 27, 1947. In 1962, this college introduced the B. Ed. course, which is the only B. Ed. Department in the entire north 24 Parganas district. GHC is awarded an "A" Grade in the 1st and 2nd cycles of NAAC in the years 2005 on May 20 and 2016 on December 16, respectively.

2.5 Mahadevananda Mahavidyalaya (MM)

Mahadevananda Mahavidyalaya is a co-educational government-aided general degree college affiliated to WBSU, established by the late Swami Jyotirmoyanand Giri Maharaj on August 15, 1968, in Mominpore, under the Barrackpore Sub Division of the North 24 Parganas of West Bengal. On February 19, 2016, the NAAC Authority awarded it an "A" grade.

2.6 Ramakrishna Mission Vivekananda Centenary College (RKMVCC)

Ramakrishna Mission Vivekananda Centenary College (RKMVCC) is an autonomous college only for male students' affiliation to WBSU status given by UGC, fully managed by the Ramakrishna Mission established in July 1963 at Rahara. This renowned college was awarded an "A" Grade by the NAAC Authority on December 10, 2014, in the 1st cycle of assessment.

2.7 Ramakrishna Sarada Mission Vivekananda Vidyabhavan (RKSMVV)

Ramakrishna Sarada Mission Vivekananda Vidyabhavan is a premier state-aided girls' college in Kolkata. It was established in 1961 under the auspices of Sarada Math. This college was accredited an "A" Grade by the NAAC Authority in its 2nd cycle on December 16, 2016.

2.8 Vivekananda College (VNC)

Vivekananda College is a state-aided co-educational general degree college under the affiliation of WBSU. It was established in 1986. In its first cycle of NAAC, this college was accredited to an "A" Grade on November 5, 2016.

3. Review of related literature

There are significant numbers of research works that have been conducted on the content analysis of different Central and State universities, technical universities, and college library websites in India. The study has been made on the contents of thirteen central university library websites in India using 29 standard checklists. The study ranked the university library based on the assessment of the results and revealed that variations are found in the websites, and a few suggestions are recommended to make the websites more user-friendly (Ambika & Ganesan, 2021). An evaluative study to analyse and evaluate the web contents of twenty-six university websites in West Bengal revealed the accessibility, currency, speed, accuracy, aesthetic value, language, user friendliness, navigation, currency, relevancy, applicability, pertinence, and qualitative nature of graphics, animations, existing library facilities, collection, and availability of services relating to the content of university websites (Das, 2021). The web-based content analysis of 11 state university library websites in the North-East state of India ranked the library websites based on a 45-point score and suggested that an effort should be made by the website developer to make the website dynamic, accurate, and user-friendly (Singha & Devi, 2021). A study on content analysis and raking of eleven library websites of the NAAC-accredited college of Kazi Nazrul University found that 100 percent of library websites linked to the college home page and also found that one library earned 'excellent, three libraries 'very good', two libraries 'good, and three libraries 'average' on the basis of rating (Mandal, 2021). The content analysis of library websites of state-aided universities in Kolkata, reported on the basis of library collection, library services, type of content, and basic features (Tunga, 2021). A study was also conducted on branding and promoting college libraries under West Bengal State University through websites to identify accessibility and speed, authority and accuracy, website aid and tools, library services and technical services, links to e-resources, etc. of college libraries for making a library website effective in terms of branding and promotion (Biswas, 2019).

It is clear from the above reviews that several studies are conducted on the content analysis, evaluation, and use of library websites of the Central University, Technical University, National Institute, general state university, and general degree colleges all over India. The study on branding and promotion of college libraries through the websites of general degree colleges at West Bengal State University is also being conducted. So, it is useful to conduct the study based on various parameters that relate to library resources and services to measure the accuracy and accessibility of webpages and to develop more meaningful library websites for colleges under West Bengal State University in West Bengal.

4. Objectives of the study

The present study has been undertaken to accomplish the following objectives:

- to analyse the contents of the library webpages of NAAC accredited "A" grade colleges under West Bengal State University, Barasat
- to find out about the library webpage profile, general information, library resources and library services, as well as the features of the college library webpages to measure the score
- to find out the accuracy, accessibility, and user friendliness of webpages
- to rank the library webpage based on the total score earned through measured scores
- to propose measures for the design and development of library webpages by library and information professionals, libraries, or colleges in the future.

5. Materials and methods

Data was collected from various webpages and websites of eight selected colleges between July 2022 and October 2022 through the survey method and observation tools using a checklist. This well-structured checklist was designed and developed with 60 criteria, which are based on earlier work on this subject by different authors. The ranking of the selected library webpages was done on the basis of a five-point grading scale. The obtained content was categorised into two variables. If it is present on the library webpage for a particular point or attribute, then it scores one. Thus, if present, the score will be 1, and if absent, it will be a 0 (Zero) score. All the collected data were tabulated and analysed for the purpose of interpretation and discussion for ranking the library webpage.

6. Analysis and discussions

The collected data were organised and tabulated using the statistical method with four categories. These are general information (score/points-20); library resources (score/points-18); library services (score/points-17); and features of library websites or pages (score/points-5). Every attribute is assigned 1 (one) mark if present (yes), i.e., present (yes) = 1 (one) and absent (No) = zero (0).

6.1 NAAC accredited "A" grade colleges under West Bengal State University

Table 1 shows that all eight colleges obtained an "A" grade by the assessment of the NAAC, and no college secured a grade above "A" under this university during the period of July to October 2022.

Table1: List of NAAC accredited "A" grade government aided colleges under WBSU

Sl No	Name of the College	Abbreviation of College	Type	Esta-blished	NAAC Grade (Latest)	URL
1	Acharya Prafulla Chandra College	APC	Govt. Aided	1960	A	http://apccollege.ac.in/
2	Barasat Govt. College	BGOVTC	Govt.	1950	A	https://bgc.ac.in/
3	Bhairab Gangully College	BGC	Govt. Aided	1968	A	https://bhairabgangulycollege.ac.in/
4	Gobardanga Hindu College	GHC	Govt. Aided	1947	A	http://www.ghcollege.ac.in/
5	Mahadevananda Mahavidyalaya	MM	Govt. Aided	1968	A	https://mmbkp.ac.in/
6	Ramakrishna Mission Vevekananda Centenary College, Rahara	RKMVCC	Autonomous (Boys)	1963	A	https://www.rkmvccrahara.org/
7	Ramakrishna Sarada Mission Vevekananda Vidyabhavan	RKSMVV	Govt. Aided (Girls)	1961	A	https://rksmvv.ac.in/
8	Vevekananda College	VNC	Govt. Aided	1986	A	https://www.vivekanandacollegemmg.edu.in/

Out of eight colleges, six are government-aided coeducational colleges; one, i.e., RKSMVV, is a government-aided Girls college; and one, i.e., RKMVCC, is an autonomous boys' college recognised by the UGC and fully managed by the Ramakrishna Mission.

6.2 Library webpage profile of NAAC accredited "A" grade govt. aided colleges under WBSU

Table 2 clearly shows that there have no separate and independent library webpages which help the user to access library information directly.

Table 2: Library website profile

Sl. no.	Name of the College and Library	Library Webpage	Content – Structured/ Linear Text
1	Acharya Prafulla Chandra College	Y	Structured
2	Barasat Govt. College	Y	Structured
3	Bhairab Gangully College	Y	Structured
4	Gobardanga Hindu College	Y	Structured
5	Mahadevananda Mahavidyalaya	Y	Linear Text
6	Ramakrishna Mission Vevekananda Centenary College, Rahara	Y	Linear Text
7	Ramakrishna Sarada Mission Vevekananda Vidyabhavan	Y	Structured
8	Vevekananda College	Y	Structured

All the colleges have library websites. Six out of eight colleges have library webpages in structured form, and two colleges, i.e., MM and RKMVCC, present their library webpages in linear form.

6.3 General Information of NAAC accredited "A" grade govt. aided colleges libraries under WBSU

Table 3: General information on libraries

General information	APC	BGOVTC	BGC	GHC	MM	RKMVCC	RKSMVV	VNC	Total (out of 8)	%
About Library/ Know your Library	Y	Y	Y	Y	Y	Y	Y	Y	8	100
Vision/Mission	-	Y	Y	-	-	-	-	-	2	25
CCTV	Y	Y	Y	-	Y	-	-	-	4	50
Collection	Y	Y	Y	Y	Y	-	Y	-	6	75
Contact Us	Y	-	Y	Y	-	-	Y	Y	5	62.5
Differently able Section	-	Y	-	-	-	-	-	-	1	12.5
Librarian	Y	Y	Y	Y	-	-	Y	Y	6	75
Library Committee	Y	-	-	Y	Y	-	-	Y	4	50
Library Hours/ Holiday	Y	Y	Y	Y	Y	Y	Y	Y	8	100
Library Rules	Y	Y	Y	Y	Y	-	Y	Y	7	87.5
Library Section	Y	Y	Y	Y	Y	Y	Y	-	7	87.5
Library Staff	-	Y	Y	Y	-	-	Y	-	4	50
Library space/location	-	Y	Y	Y	-	-	Y	Y	5	62.5
Library Membership	Y	Y	Y	Y	Y	Y	Y	Y	8	100
Photo Gallery	-	-	-	Y	-	-	Y	-	2	25
External Membership	Y	-	-	Y	Y	-	Y	-	4	50
Library Preservation	-	Y	-	-	-	-	-	-	1	12.5
Open Access	Y	Y	Y	Y	-	-	Y	-	5	62.5
Dept./Seminar Library	Y	Y	-	-	-	-	Y	Y	4	50
Library Automation	-	-	Y	-	Y	Y	Y	Y	5	62.5
Total Score (Max.20)	13	15	14	14	10	5	15	10	-	-

The survey shows that all the library webpages of 8 colleges provide information about the library, library hours, library holidays, and library membership.

6.4 Library Resources of NAAC accredited "A" grade govt. aided colleges libraries under WBSU

Table 4: Library collection/resources

Library Resources	APC	BGOVTC	BGC	GHC	MM	RKMVCC	RKSMVV	VNC	Total (out of 8)	%
Back Volume of Printed Journals	-	-	-	Y	Y	-	-	-	2	25
Books	Y	Y	Y	Y	Y	Y	Y	Y	8	100
Cassettes/CD/ DVDs	Y	Y	-	-	Y	-	-	-	3	37.5
Database	Y	Y	Y	Y	Y	-	Y	Y	7	87.5
Digital Archive	-	-	-	Y	-	-	-	-	1	12.5
E-books	Y	Y	Y	Y	-	-	Y	Y	6	75
E- Database	Y	Y	Y	Y	Y	-	Y	Y	7	87.5
E-Journals	Y	Y	Y	Y	-	-	Y	Y	6	75
Printed Journals	Y	Y	Y	Y	Y	-	Y	Y	7	87.5
News Paper	Y	-	Y	Y	-	-	Y	Y	5	62.5
N-List	Y	Y	Y	Y	-	-	Y	Y	6	75
Link to other websites	-	-	Y	Y	-	-	Y	-	3	37.5
Old Question paper	Y	-	Y	Y	-	-	Y	Y	5	62.5
Printed General Magazines	Y	Y	Y	Y	Y	-	Y	Y	7	87.5
Study materials	-	-	Y	-	-	-	Y	-	2	25
Syllabus	-	-	Y	-	-	-	-	-	1	12.5
Rare Books	-	-	-	Y	-	-	-	-	1	12.5
E-learning Centre/ILC	Y	-	-	-	-	-	Y	-	2	25
Total Score (Max.18)	12	9	13	14	7	1	13	10	-	-

The table 4 shows the availability of library resources. All are mentioned on the library webpages.

6.5 Library services of NAAC Accredited "A" grade govt. aided college libraries under WBSU

Table 5: Library services

Library Services	APC	BGOVTC	BGC	GHC	MM	RKMVCC	RKSMVV	VNC	Total (out of 8)	%
Circulation	Y	Y	Y	Y	Y	Y	Y	Y	8	100
CAS	Y	Y	Y	Y	Y	-	Y	Y	7	87.5
Digital Library/ Repository	-	-	-	Y	-	-	Y	-	2	25
Email Service	Y	-	Y	Y	-	-	-	Y	4	50
ILL	-	-	Y	-	-	-	Y	Y	3	37.5
Internet Service	Y	Y	Y	Y	Y	-	-	-	5	62.5
Carries/Jobs Information	Y	Y	Y	Y	Y	-	Y	Y	7	87.5
Newspaper / E-News paper	Y	-	Y	Y	-	-	Y	Y	5	62.5
Referral Service	Y	-	-	Y	-	-	Y	-	3	37.5
OPAC Facilities	Y	Y	Y	Y	Y	-	Y	Y	7	87.5
New Arrivals	Y	-	Y	Y	-	-	Y	-	4	50
Card Catalogue	-	Y	-	Y	Y	-	-	-	3	37.5
Reading Rooms	Y	Y	Y	Y	Y	-	-	Y	6	75
Reference Service	Y	Y	Y	Y	Y	Y	Y	-	7	87.5
Reprographic Service	Y	Y	Y	Y	Y	-	Y	-	6	75
Web OPAC	-	Y	-	Y	-	-	Y	-	3	37.5
Wi-Fi	-	Y	Y	-	-	-	-	Y	3	37.5
Total Score (Max.17)	12	11	13	15	9	2	12	9	-	-

Table 5 explores the library services in the said eight colleges which are mentioned on their library webpages.

6.6 Feature of NAAC accredited "A" grade govt. aided college libraries website under WBSU

Table 6: Feature of college library webpage

Feature of Library Website	APC	BGOVTC	BGC	GHC	MM	RKMVCC	RKSMVV	VNC	Total (out of 8)	%
Ask a Librarian	Y	-	Y	Y	-	-	-	-	3	37.5
Direct Link to other Resource	-	-	Y	Y	-	-	Y	-	3	37.5
User Orientation	-	Y	-	Y	Y	-	Y	-	4	50
Users feedback	Y	-	-	Y	-	-	Y	-	3	37.5
FAQ'S	-	-	-	-	-	-	-	-	0	0
Total Score (Max.5)	2	1	2	4	1	0	3	0		

All the surveyed library webpages, i.e., 100%, are linked to the respective college website homepages. The user orientation programme is present in four colleges (50%) and information on 'Ask a Librarian,' 'Direct Link to Other Resources,' and 'User Feedback' is provided by three colleges (37.5%).

6.7 Comparative checklist of NAAC accredited "A" grade colleges library webpage under WBSU

Table 7 shows information about the overall ranking of the library webpages of eight NAAC accredited "A" grade colleges under WBSU. It was found that the maximum amount of information in the college library webpages provided by GHC obtained 47 points, which is the highest point among the 8 surveyed libraries. RKSMVV earned 43 points, and BGC scored 42 points to secure the 2nd and 3rd highest places, respectively.

Table 7: Comparative checklist

College Library Website	General Information (20)	Library Resources (18)	Library Services (17)	Features of College Library website (5)	Total score out of 60
APC	13	12	12	2	39
BGOVTC	15	9	11	1	36
BGC	14	13	13	2	42
GHC	14	14	15	4	47
MM	10	7	9	1	27
RKMVCC	5	1	2	0	8
RKSMVV	15	13	12	3	43
VNC	10	10	9	0	29
Total	96	79	83	13	271

Table 7 shows information about the overall ranking of the library webpages of Eight NAAC accredited “A” grade colleges under WBSU. It is found that the maximum amount of information in the college library webpages provided by GHC obtained 47 points, which is the highest point among the 8 surveyed libraries. RKSMVV earned 43 points, and BGC scored 42 points to secure the 2nd and 3rd highest places, respectively.

6.8 Rating Scale for ranking of NAAC accredited "A" grade college library webpages

Table 8: Rating scale for ranking of the college library webpages

Range of Points	Results
01 - 12	Poor/Need to Improvement
13 - 24	Average
25 - 36	Good
37 - 48	Very Good
49 - 60	Excellent

In this table, a five-point ranking scale was used and fixed equally based on the maximum score of 60 points during the study period. This quantitative five-point rating scale was designed to evaluate a checklist of eight selected colleges.

6.9 Ranking of NAAC accredited "A" grade college library webpage

Table 9: Ranking of college library webpages

College Library Websites	Total Score out of 60	Rating Scale	Results	Rank
Gobardanga Hindu College	47	37 - 48	Very Good	1
Ramakrishna Sarada Mission Vevekananda Vidyabhavan	43	37 - 48	Very Good	2
Bhairab Gangully College	42	37 - 48	Very Good	3
Acharya Prafulla Chandra College	39	37 - 48	Very Good	4
Barasat Govt. College	36	25 - 36	Good	5
Vevekananda College	29	25 - 36	Good	6
Mahadevananda Mahavidyalaya	27	25 - 36	Good	7
Ramakrishna Mission Vevekananda Centenary College	8	01 - 12	Poor/Need to Improvement	8

It is revealed that GHC library got the highest score of 47, followed by RKSMVV library with 43 points, BGC library with 42 points, and APC library with 39 points out of 60 points, securing 1st, 2nd, 3rd, and 4th positions, respectively, under the "Very Good" category. The 3 libraries, i.e., BGOVTC, VNC, and MM, are ranked 5th, 6th, and 7th in the "Good " category, earning the points 36, 29, and 27, respectively. The RKMVCC library website ranked 8th falls under the "Poor/Need Improvement" category because it earned only 8 points out of 60 parameters.

7. Major findings

The major findings of this study on the content analysis of college library webpages of "A" graded colleges in WBSU during the study period are given below:

- There are no separate library websites. All eight library webpages are connected with their respective college websites, so users cannot directly access library information.
- Only two of the college's library webpages are in "Linear Form" and the rest of the library webpages are in "Structured Form".
- Only BGOVTC college library webpage has provision of two vital points of information on "differently able" people and "Library Preservation". No other library webpages provide any information on these two important points.
- GHC library webpage has provided the highest information (77.77%), and RKMVCC library webpage has provided the least information (5.55%) on "Library Resources". Whereas very few libraries have provided information on "Study Materials", "Syllabus", "Back Volume Journals", "Rare Books", "E-Learning centres," and "Digital archives."
- It is revealed that the highest (88.23%) information is provided on library services by the GHC library webpage and the lowest (11.76%) information is provided by RKMVCC on this field.
- It is found that no library provides information on "FAQs," though this feature is very important for solving some basic problems in the library webpage features category.
- The GHC library webpage has acquired the highest score and stood at the 1st rank, and the RKMVCC library webpage is placed in the last position ranked among the eight colleges.
- Most of the colleges have obtained a 'Very Good' or 'Good' rank, but none of the library's webpages has been ranked in the "Excellent" category.

8. Conclusion

From this study, it is learned that most of the library webpages are mainly static in nature, and the same piece of information that is collected from eight selected colleges is scattered in different areas of the library webpage. To achieve the best evaluation of any library webpage, it is of utmost necessity to design uniformly structured and standardly recorded information required in college library webpages. Every library authority should provide sufficient funds, resources, and other logistical support, such as engaging efficient ICT professionals to upgrade the library webpages continuously at regular intervals. At the same time, user feedback and comparison to other library webpages of similar types of colleges are very important. This study also sheds light on the upgrading and systematic development of library webpages and gives some suggestions that will help LIS professionals as well as ICT professionals to manage the better library webpages of any general degree colleges in West Bengal as well as in India.

References

Affiliated college, West Bengal State University. (2022, Oct. 12). Retrieved from https://wbsu.ac.in/affiliate-college-name-list/ .

Ambika, C.A., &Ganesan, P. (2021). Central University library websites in India: web contentanalysis. *Library Philosophy and Practice* (e-journal). 5405. Retrieved from https://digitalcommons.unl.edu/libphilprac/5405.

Biswas, A. (2019). Banding and promoting college libraries under West Bengal State University through websites: a study. *College Libraries*, 34 (2), 15-27.

Das, A., & Gurey, P. (2021). Web content analysis of State University websites of West Bengal: an evaluative study. *Library Philosophy and Practice (e-journal.* 6691. Retrieved from https://digitalcommons.unl.edu/libphilprac/6691.

Kuri, R., & Maranna, O. (2018). Content analysis of Central University library websites of South India. *National conference on "Librarianship in Next Generation Libraries* March 2018, 98-105.

Mondal, N. (2021). Content analysis and raking of library websites of NAAC accredited colleges of Kazi Nazrul University: a study. *College Libraries,* 36 (3), 74-86.

Tunga, S. K. (2021). Content analysis of library websites of state aided universities in Kolkata city, West Bengal: an evaluative study. *College Libraries,* 36 (1), 39-50.

Singh, S. C., & Devi, K. K. (2021). Web-based content analysis of State University library website in the North Eastern States of India: a study. *College Libraries,* 36 (2), 99-108.

Verma, M. K., & Devi, K.K (2015). Content analysis of Central Universities library websites of North Eastern States of India: a survey. *Journal of Research in Librarianship,* 2(5) Sep-Oct, 48-59.

Role of Public Libraries in Promoting Peace and Social Cohesion through United Nation's Sustainable Development Goals (SDG): with special reference to Azadi ka Amrit Mahotsav

Smitanjali Panda

Ph.D. Research Scholar, Department of Library and Information Science, Jadavpur University

Prof. (Dr.) Subarna Kumar Das

Department of Library and Information Science, Jadavpur University

Abstract

The aim of this research is to review the role of public libraries in development of social cohesion and peace in communities and societies with the help of the Sustainable Development Goal (SDG). It presents a conceptual framework in which peace and social cohesion can be implemented in communities and societies through public libraries. The 17 United Nations' SDGs have been discussed with special reference to promoting peace, and social cohesion through different methods and mediums which can relate to the influence of public libraries in different social development and activities that can play a major role in the communities. Through the review of scholarly literature, this paper has shown the public library as a metaphor for information provision that enhances peace and social cohesion in the communities. Libraries - especially public and community libraries allow members of communities to meet and exchange in a shared space, often supported by shared resources and heritage. The presented work helps to get an overview of sustainable peace and social cohesion developed among communities with the help of public libraries and its activities in the LIS field and additionally, potential research gaps may be identified. The authors call for more research in this area and concrete ideas to help develop a sustainable future. The value of this paper is in its identification and discussion of the views and position on the concepts of library, peace and social cohesion.

Keywords: Public libraries, Peace and social cohesion, Sustainable Development Goal (SDG)

1. Introduction

All libraries have a collective mission to democratise access to information and learning - regardless of where they're located or the type of community they serve. This goes hand in hand with the themes that underpin the 2030 Agenda for Sustainable Development: empowerment, resilience and equality. Libraries are a core piece of our social infrastructure, fostering community engagement and social services, and that means they naturally contribute to the people-focused SDG. Now, as we emerge from the global pandemic, libraries are still facing challenges. SDGs have seventeen goals and 169 targets that show the eagerness of governments globally to reduce poverty and hunger and to tackle poor quality education,

ill-health, gender inequality, social harmony, environmental degradation and empowerment for peoples of the world. These goals respond to the world's most development challenge. It is argued that the purpose of development is to improve people's lives by expanding their choices, freedom and dignity (Igbuzor, 2006).

2. Literature review

The success of any institution, country, and society rests squarely on the adequacy of its library collections because the library is also seen as an agency for findings, discovery, innovation, vocational skills, repository, scholarship and research (Buchannan, 1994; Adeleke, Okusaga, & Lateef, 2002; Dada, 2016). Public libraries serve the community by providing diverse services and assisting community members in becoming literate and aware on their own (Biswas, Rai, & Chakraborty, 2023; Pandit & Biswas, 2023; Chakraborty, Tamang, & Biswas, 2023) along with contribution to peaceful and inclusive societies by providing safe, inclusive and open civic spaces. They help inculcate civic understanding by actively engaging with their communities, embracing minorities and responding to local information, cultural, educational and other social needs (Byrne, 2018).

Some studies focus on social cohesion in cities and local communities. Kearns and Forrest (2000) presented a good overview of this literature and in doing so provided a useful list of the five constituent elements they found in the ways the concept was used. Those were : (i) common values and civic culture; (ii) social order and social control;(iii) social solidarity and reductions in disparities of wealth; (iv) social networks and social capital; (v) territorial belonging and identity. According to Abata-Ebire (2018), public libraries play an important role in achieving SDGs as it is globally considered a centre of research and knowledge generation to empower people and address human challenges.

Onoyeyan and Adesina (2014) outlined ways that library and information services can make their impact felt towards achieving sustainable SDG. In recent years, the library as a place connecting people and enabling interaction is emphasised in relation to social inclusion and community building (Goulding, 2009). Bradley (2014) elaborated that a well-informed society contributes significantly to the eradication of poverty and the development of the nation as the availability and access to information resources and services would promote peaceful and inclusive societies for sustainable development. However, previous research on the public library and its contribution to peace, community building, social cohesion and social sustainability assumes libraries to be self-evidently and naturally safe and open places where adversities of users meet.

3. Objectives of the study

The main objectives of the study are as follows:

- to assess the role of public libraries in social cohesion that can enhance community social development
- to explore public libraries' role in promoting sustainable peace.

4. Study method

The methodological approach for this study involved literature review. In this paper, online information sources were utilised together with published and grey literature using the search filters "public library and peace and social cohesion and SDGs" and "public library and SDGs".

5. Public library

A public library which is very often called a "peoples university", is a democratic institution operated for the people by the people that conserves and organises human knowledge. The scope or command of a public library that meets not specific but general requirements of the public thus remains quite broader in its vision. It differs from the other types of libraries in that by offering opportunities for informal self-education, it inculcates reading habits amongst all types of general readers (Chakraborty, Tamang, & Biswas, 2023) and, as a consequence, maintains a sizeable collection of light literature, i.e., fictions, novels, story books, etc., for recreational studies, and a children's corner equipped with juvenile literature.

5.1 Value of the public library service

A modern and well-resourced public library contributes to the social, economic and cultural well-being of communities. It provides information, supports learning and culture and is a focal point for a growing number of public services. The library is a trusted space, integrated into the local community and accessible to all. It is a resource for developing digital skills and literacy, it provides cultural and educational outreach programmes that empower communities, facilitate community cohesion, reduce isolation and contribute to the pride of place. It is a catalyst for change, facilitating social, economic and cultural development and supports communities to take advantage of the opportunities afforded them by modern society.

5.2 Social cohesion as social inclusion

The concept itself, and therefore the expectation of a relationship between social cohesion and social development, is relatively recent. From an operational point of view, a strategy of social cohesion refers to any kind of action which ensures that every citizen, every individual, can have within their community, the opportunity of access: to the means to secure their basic needs; to progress; to protect the legal rights; and to gain dignity and social confidence. Any insufficiency of access to any of these fields operates against social cohesion (Council of Europe, 2001).

The concept of socio-economic cohesion has been developed and initially measured at different scales as a proxy of inclusion and equality, and is based on the application of a set of dimensions and indicators (economic: income level, productivity, employment, and social: equality and social inclusion, social capital, cultural identity, health and education, mobility…) over a given population sample. The establishment of cohesive societies is key to enhance the wellbeing of their members and building resilience to social tensions and conflict. Territorial cohesion is a more recent (and still evolving) concept that has grown out of the EU priority of redressing existing marked unbalances in the level of development of its territories (related, in turn, to differences in terms of resources efficiency, innovative capacity, socio-economic infrastructure and services, access to capital and markets, skilled labour force).

Social cohesion refers to the degree of social connectedness and solidarity between different community groups within a society, as well as the level of trust and connectedness between individuals and across community groups. Social cohesion is a multi-dimensional concept (Babajanian 2013; UNDP 2020). It connotes strong social relationships, shared values, feelings of identity and the sense of belonging to a certain community, at times measured by the level of

trust in society (Berger-Schmitt 2000; UNDP 2020). It has been characterised as 'the glue that holds society together' (Loeweet al. 2019). 'Social cohesion refers to both, the vertical and the horizontal relations among members of society as characterized by a set of attitudes and norms that includes trust, an inclusive identity, and cooperation for the common good' (Loewe et al., 2019).

Trust, social cohesion, equity and social exclusion are related to the concept of social sustain ability (Bramley & Power, 2009; Vallance et al., 2011). The concept has been recently been put to the fore in Agenda 2030. However, social aspects of sustainable development are highlighted already in the preceding UN report "Our Common Future" (World Commission on Environment and Development, 1987), also known as the Brundtland report. This report emphasises three aspects of sustainable development; economic growth, environmental protection and social equity.

5.3 Cohesion indicators

After some consideration of the most useful definition, on defining 'social cohesion as the nature and extent of social and economic divisions within society' (Easterly et al., 2006). With this definition, the concept can be measured by three kinds of indicators: (1) ethnic

Features	Comments
Establishments	✓ Established out of community need ✓ Requires full cooperation from the community
Governance	✓ Participative administration through committee formation from different sections of the community. ✓ This participation ensures relevant services
Finance	Funds provided through donation or asset sharing
Aims and Objectives	Proactive service towards the community information needs and empowerment of all sections of the community of specifically disadvantaged groups. Making all relevant resources are available to the community members.
Users	Community library should determine the membership nature – open to all or restricted to the members of the locality.
Information provision	Mainly two types of information need to be collected. The information indigenous to the community or the knowledge produced by the community, should be known by other members of the locality and outsiders also. Livelihood information including survival information and citizen action information are required for the well-being of the community members.
Services	Active interaction between community library volunteers and the members of the community.
Staffs	Unlike public libraries, the community library staff should be from the community so that the client group or the community members can easily convey their requirements to them. They should be well known and can be trusted by the members.
Cooperation	Active cooperation is required between the library staff and the user group. Library and other social organisations should maintain a stable cooperative relationship among themselves.

diversity; (2) income distribution; (3) trust and other attitudes. After determining the indicators of group cohesion, we may now think about a broader perspective - social cohesion.

5.4 Social primary indicators

Social primary indicators are cohesion, trust, norms, networks, coordinated action to achieve common objectives, interethnic relationship, social inclusion, institution and governance, individual's susceptibility to the interpersonal influence of other members, participation in group activities, co-operativeness, contributions to the welfare to the groups, person's intention to remain in the group, identification with the group and interpersonal ties.

Mostert (1998) identified some characteristics of community libraries covering almost all aspects. From the above table, it becomes clear that every aspect of community library is intermingled with the members of the community.

6. Peace

Peace initiatives came to educate citizens of the world towards ensuring a peaceful world. Libraries will help drive and teach peace education in their various communities by providing information/ knowledge resources on peace and conflict both directly and indirectly. When this is done a great deal would have been achieved over time having a broad minded and enlightened individual who now have better thinking and reasoning ability, who will uphold national identity rather than ethnic identity (indigeneship) which our leaders prefer. They can now understand and resist the urge, inducements and instigations to start violence, know how to negotiate, mediate and manage conflicts in the worst case scenarios, thereby promoting peaceful coexistence in society. It is therefore, the concern of this paper to attempt to identify and discuss various pragmatic roles libraries play to promote social peace. The paper briefly reviewed literature on libraries and peace, and then discussed the roles libraries should play in promoting peace. It has also looked at some challenges the library encounters in supporting peace.

7. Role of library in promoting peace

- **Support for education**

  As the level of education differs so are their levels of teaching and learning. The main role of library in education is the provision of access to recorded knowledge/information to its community especially in the formal education sector. Education will help enlighten the people from the primordial sentiments/thoughts that encourage ethnic identity consciousness and enthrone national consciousness and identity.

- **Preservation of cultural heritage**

  Preservation and conservation of cultural heritage had been the prime function of libraries especially, public and national libraries. Libraries especially public and national have direct charge to collect and preserve works/materials embodying the cultural heritage of their communities in all available formats and also make them available when needed, whether solicited for or not. The libraries can reach out to the public informing them of the existence of various materials of their cultural heritage which has the capacity to enlighten their minds on the norms and values of their society.

➢ **As an agent of change in the society**

Change is the only thing in life that is constant. Materials on social justice, human rights, gender equality, politics, civic education, corruption, good governance, poverty eradication, national consciousness, etc. and other related materials that will awaken the consciousness of the readers to a rebirth giving way to the old order that is dividing and deepening our conflict should be provided by libraries. These materials would help our democracy to be rooted thereby guaranteeing people's freedom, improved well-being and paving the way for sustainable peace.

8. Challenges of public libraries in promoting peace and social cohesion

From the foregoing, it is obvious that there are many challenges that work against libraries performing their role in promoting peace and social cohesion. Some of these challenges include:

High illiteracy rate

This kind of tolerable and avoidable crisis we have been experiencing all these years, whether religious, ethnic, or political. It therefore suffices to say that with continuous high illiteracy rate in the country getting people to read or comprehend concepts, tolerate others, communicate effectively, and critically analyse information will not yield good results.

Poor funding

This affects the library's provisions of current and relevant information materials, including materials that will promote peace education. The poor funding of education could be a result of unacceptance of education as being a major enabler of any development or lack of political will power.

Non impactful government

Government and its agencies including religious bodies, and other stakeholders in the promotion of peace are not doing enough to preach the message of peace through the libraries. Perhaps, they did not see what libraries can do to promote peace. The library can actually help in promoting peace, if they are carried along by relevant stakeholders.

Poor reading culture

One thing is providing the needed materials as the libraries do and another thing is optimal utilisation of these materials. Scholars have advanced some factors responsible for poor reading culture, among which are poor home environment, poor implementation of government policies, poor funding of education sector, poor library facilities including reading materials, absence of library hours in curriculum.

Azadi Ka Amrit Mahotsav is an initiative of the Government of India to celebrate and commemorate 75 years of independence and the glorious history of her people, culture and achievements. Therefore, this Mahotsav is a festival of awakening of the nation; festival of fulfilling the dream of good governance; and the festival of global peace and development. The role of public libraries in the freedom movement with special reference to rural and local public libraries helped the national movement go far beyond its original elite intellectual confines.

9. Conclusion

Study reveals that there will be no sustainable development in any society without sustainable peace and social cohesion. UN SDG on peace and social cohesion has so far sharpened the nation's commitment to developing communities

leading to improved human development, skill improvement and gender equality. Peace and cohesion play important roles in shaping people's attitudes, critical thinking and helping them make informed decisions. With growing complexities of present day society and the increasing demand for information, it is important for more community development oriented activities to support public library services in developing nations. Active small rural public libraries can add significant quality to the quality of life in rural communities. It was also seen that democracy has the capacity to keep people relatively peaceful. It was also shown that in promoting peace and social cohesion, public libraries could play roles like, support for education, teaching skills, current awareness services, and preserving cultural heritage among others were discussed. However, libraries face some challenges in performing these roles like poor funding of libraries, high illiteracy rate, etc.

References

Abata-Ebire, B.D., Adebowale, J.A., & Ojokuku, B.Y.(2018).Achieving sustainable development goals (SDGS) in Nigeria: the roles of libraries. *International Journal of Applied Technologies in Library and Information Management,* 4(2), 89-95.

Ashwill, M., & Norton, A. (2015). *Rights and social action for risk management: reflections on local, national and international roles and responses.* London: Overseas Development Institute (ODI).

Bill & Melinda Gates Foundation. (n.d.). *Global libraries impact planning and assessment guide.* Retrieved from http://www.publiclibraryadvocacy.org/wp-content/uploads/2015/06/IPA-Guide-2015.pdf

Biswas, A., Rai, N., & Chakraborty, R. (2023). Public library system and services in Kalimpong district with special reference to block II. In Saha, T. (Ed.), *Read, Learn, Grow: Lifelong Learning in Public Libraries.* Kolkata: Urmi Publications. Retrieved from https://www.researchgate.net/publication/372439565_Public_Library_System_and_Services_in_Kalimpong_District_with_Special_Reference_to_Block_II

Bradley, F. (2014). *What are the United Nations SDGs and what do they mean for libraries?* The Hague: IFLA.

Bradley, F. (2017). *How libraries contribute to sustainable development& SDGs.* Retrieved from https://www.ifla.org/files/assets/alp/103-fbradley-alp.pdf

Burgess, K. (2005). *Public libraries and sustainable communities.* Retrieved from http://www.sl.nsw.gov.au/services/public_libraries/docs/finaldiscussionpaper.pdf

Caidi, N. (2006). Building civilizational competence: a new role for libraries? *Journal of Documentation,* 62,194-212.

Chakraborty, R., Tamang, Karchen Y., & Biswas, A. (2023). Reading habits of public library users of Mirik sub-division: a study. In Saha, T. (Ed.), *Read, Learn, Grow: Lifelong Learning in Public Libraries.* Kolkata: Urmi Publications. Retrieved from https://www.researchgate.net/publication/372439845_Reading_Habits_of_Public_Library_Users_of_Mirik_Sub-division_a_study

Dutton, William H. (2004). *Social transformation in an information society: rethinking access to you and the world.* Paris: UNESCO. 138p. Retrieved, from http://portal.unesco.org/ci/en/ev

Engstrom, C. (2009). Promoting peace, yet sustaining conflict? a fantasy-theme analysis of seeds of peace publications. *Journal of Peace Education,* 6(1), 19-33. Retrieved from EBSCO Host database.

Gattrell, A., Thomas, C., Bennett, S., Bostock, L., Popay, J., Williams, G., & Shahtahmasebi, S. (2000). Understanding health inequalities: locating people in geographical and social spaces. In Graham, H (Ed.), *Understanding Health Inequalities* (pp. 156 - 169). Open University Press, Buckingham.

Goulding, A. (2009). Engaging with community engagement - public libraries and citizen involvement. *New Library World,* 110 (1-2), 37-51.

Harris, Ian M. (1999). Peace education: colleges and universities. In *Encyclopedia of Violence, Peace, and Conflict,* 2 (F-Pe). Academic Press. 820 P.

Kosciejew, M. (2020). Public libraries and the UN 2030 agenda for sustainable development. *International Federation of Library Associations and Institutions,* 46(4), 328-346. Retrieved from https://doi.org/DOI: 10.1177/0340035219898708

Lal, J. (2018). The role of public libraries in socio-cultural development in rural areas in India. *Library Progress (International).* 38 (2),299-313.

Mansour, E. (2020). Libraries as agents for development: the potential role of Egyptian rural public libraries towards the attainment of sustainable development goals based on the UN 2030 agenda. *Journal of Librarianship and Information Science,* 52(1), 121-136. DOI: 10.1177/0961000619 872064 journals.sagepub.com/home/lis

Ministry of Culture, Government of India. *Azadi Ka Amrit Mahotsav.* Retrieved from https://amritmahotsav.nic.in

Mostert, B.J. (1998). Community libraries: the concept and its application - with particular reference to a South African community library system. *International Information &Library Review,* 30 (1), 71-85.

Pandit, Subhendra K., & Biswas, A. (2023). Role of RRRLF in the development of public library system and services in India in 21st century. In Saha, T. (Ed.), *Read, Learn, Grow: Lifelong Learning in Public Libraries.* Kolkata: Urmi Publications. Retrieved from https://www.researchgate.net/publication/372439791_Role_of_RRRLF_in_the_Development_of_Public_Library_System_and_Services_in_India_in_21st_Century

Patel, M. (2011). *Recognizing the role of libraries in peace education.* Retrieved from https://shodhganga.inflibnet.ac.in:8443/jspui/handle/10603/192149

Power, A., & Wilson, W. J. (2000). *Social exclusion and the future of cities.* Retrieved from http://eprints.lse.ac.uk/6470/1/ Social_Exclusion_and_the_Future_of_Cities.pdf

Schmidt, J. (2018). *Going green: implementing sustainable strategies in libraries around the world buildings, management, programmes and services.* Walter de Gruyter.

UNESCO (2003). *UNESCO's basic texts on the information society.* Paris: UNESCO. 116P. Retrieved from http://portal.unesco.org/ci/en/ev.

United Nations (2015). *Transforming our world: the 2030 agenda for sustainable development.* New York: United Nations.

Vallance, S., Perkins, H., & Dixon, J. (2011). What is social sustainability? A clarification of concepts. Geoforum, 42(3), 342-348.

Core Courses of Master's Programme in Library and Information Science of SAARC Countries: a curriculum study

Preeti

Research Scholar, Department of Library and Information Science, Maharshi Dayanand University, Rohtak

Dr. Nirmal Kumar Swain

Professor, Department of Library and Information Science, Maharshi Dayanand University, Rohtak

Abstract

The present study focuses on the analysis of the curriculum of Library and Information Science (LIS) education at the postgraduate level in SAARC countries. SAARC, comprising Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka, is an international organisation dedicated to regional cooperation in South Asia. The study investigates in detail the master's degree programmes in Library Science education offered by the oldest universities in each SAARC nation. The findings have revealed that only five countries are providing education in the field of LIS at the master's level. The selected universities for this study are Tribhuvan University, University of Delhi, University of Dhaka, University of Kelaniya, and University of Karachi, representing the five countries offering masters in LIS. The analysis of the curriculum has highlighted several common core courses taught across these universities, including library classification, management of library & information science, information services and sources, library cataloguing, research methodology, and thesis preparation. This study provides valuable insights into the current state of LIS education in SAARC countries and serves as a foundation for future research and curriculum development in the field.

Keywords: Curriculum, Curriculum analysis, Library Science, LIS education, Master's programme, SAARC, South Asia

1. Introduction

Through the curriculum, educators impart education to the learners. Societal justice is based on the implementation of social reforms that have the ability to end cycles of oppression (Clayton & Williams, 2004). One of the main ways teachers work toward social justice goals is by making changes to the education system to make it more open (Banks, 2010). Most students do not have access to different points of view, which is one of the main reasons why the multicultural curriculum is being changed.

Generally, a curriculum taught in any country is country centric on that country. Curriculum disparities may be very detrimental to all students. Teachers use what they know to fill in gaps in the curriculum. Teachers are "transformative intellectuals" (Giroux, 1984) because they know they can promote and legitimise a wide range of political, economic, and social interests. They

also act as "transformative intellectuals" by embracing and using different ways of teaching in the classroom. Students benefit most from this kind of critical pedagogy because it helps them start to see themselves as important parts of the process of building knowledge (Kumasi & Manlove, 2015). Students also learn that learning in school is a process with values that need to be constantly questioned by teachers, students, and administrators from a wide range of cultural backgrounds.

When addressing ways to improve education, librarians, and university administrators often criticise LIS curricula. Concerns are still being raised about LIS education, how the field defines itself, and what it does professionally (Biswas, 2013; Biswas & Chakrabarti, 2014). When assessing a country's educational system and curriculum, it is important to look at how it relates to and borrows from the educational systems of other countries (Biswas, 2022). In the same way, it is important to think about the different stages of education (bachelor's, master's, and Ph.D.) and other parts of a growing education process. The present study is focused on the LIS curriculum offered by the SAARC nations.

2. About the universities and departments

Master's level education is not offered in all the SAARC nations. Three countries that do not provide master's level education are Bhutan(Ransom, 2011), Maldives (Jayasuriya, Riyaz, & Majid, 2021), and Afghanistan (ACKU, 2011) are the only ones that do not offer LIS education up to master's level. It was observed that five countries are offering master's degree programmes in the SAARC countries. Following are the five countries that provide master's degree programmes in LIS as mentioned in table 1:

Table 1: Country offering master's degree course

Country	University	Reference
Bangladesh	University of Dhaka	Riyaz, 2012
India	University of Delhi	Kumar & Sharma, 2010; Biswas, 2021
Nepal	University of Tribhuvan	Nepal National Library, 2006
Sri Lanka	University of Kelaniya	https://ss.kln.ac.lk/depts/lisc/index.php/about-us/history
Pakistan	University of Karachi	Malik & Ameen, 2017

2.1 Tribhuvan University (Nepal)

In 1959, Nepal founded Tribhuvan University. In 1995, the LIS department was established within the Faculty of Humanities and Social Sciences (Tribhuvan University, 12thDec, 2022). Since its inception, the department has offered one-year post-bachelor course (B.Lib.Sc.). The department upgraded library education to M.Lib.Sc. in 2002. In Nepal, the Master of LIS programme is a major professional advancement for librarians (Tribhuvan University,13thDec, 2022).

2.2 University of Karachi (Pakistan)

Karachi University was established in June 1951 after the Karachi University Act was approved (Karachi University, 14thDec,

2022). When it comes to library studies in Pakistan, Karachi University was the first university in the country that started a master's in LIS education. Some of the big steps forward in the field of LIS education were a postgraduation diploma in LIS (1956), a Master's Degree (1962), a Ph.D. (1967) and M.Phil. (1985) (Karachi University, 15thDec, 2022).

2.3 University of Delhi (India)

In 1922, the Central Legislative Assembly established Delhi University as a residential, unitary, teaching university. Its commitment to education, research, and community service is exemplary (Delhi University, 14th Dec, 2022). There are around 7,000 students enrolled in its 16 faculties and 80+ departments. The LIS department at the University of Delhi was established under the Faculty of Arts in 1946. This department was the only one that provided the BLISc, MLISc, MPhil, and Ph.D. degrees (Delhi University, 13thDec, 2022; Biswas, 2021).

2.4 University of Kelaniya (Sri Lanka)

The university was founded in 1875 as an educational institution for Buddhist monks. It was one of the two most important places in the country for traditional higher education, and it started the national movement and resurgence (University of Kelaniya, 12th Dec, 2022). The department of LIS was established in 1973 in order to provide graduates with more employment options. Staffing government and non-government libraries and information centres in Sri Lanka and elsewhere is the prime objective of this department. This is the only department in the university system of Sri Lanka that still provides LIS as a BA and BA (Hons) degree programme. Students are admitted to the B.A. (Honours) programme based on their performance in the first-year qualifying examination. The university offers 'Master of Arts (MA) in LIS' and 'Master of Social Sciences (MSSc) in LIS' both of these courses are one-year programmes. Both programmes make a two-year integrated programme. The department also offers M.Phil. and Ph.D. degree programmes.

2.5 University of Dhaka (Bangladesh)

The University of Dhaka was established on July 1, 1921. The University contains 13 Faculties, 83 Departments, 12 Institutes, 20 residential halls, 3 dorms, and about 56 research centres at present. There are now about 37018 students, and there are about 1992 professors (Dhaka University, 15thDec, 2022). Concerning the department, was started in 1959 as the Department of Library Science, which only offered a diploma course. Later, it started providing a degree called "Master of Library Science." In 1987, when a three-year B.A. honours programme was started, the department changed its name to the Department of LIS. The department was renamed "Department of Information Science and Library Management" (ISLM) in 2001. At this time, the Department offers a four-year Honours B.A. and a one-year Master of Arts. the department also offers are a two-year M.A. (Evening), a two-year M. Phil, and a three-year Ph.D. degree (Dhaka University, 15thDec, 2022).

3. Objectives

The prime objectives of the present study are as follows:

- to identify the status of LIS education in SAARC countries;
- to analyse the core course curriculum of masters in LIS;
- to check the credit hours in masters in LIS.

4. Methodology

To achieve the objectives of the study, data was collected from the official websites of the selected universities. The official websites were considered reliable sources of information to gather relevant data on the current status of LIS education. The researcher carefully examined the websites of each university to gather comprehensive and up-to-date information on the curriculum, course structure, faculty profiles, admission requirements, and any additional details related to LIS education. By utilising this data collection method, the study ensured the accuracy and reliability of the information obtained for analysis. Overall, this research methodology focused on a systematic approach of data collection from official university websites, enabling the researcher to gain insights into the current state of LIS education in the selected SAARC countries.

5. Data analysis

Table 2: Course Offered

University	Courses Offered	Department Name	Faculty
University of Dhaka	UG, PG, M.Phil., PhD	"Dept. of Information Science and Library Management"	"Faculty of Art"
University of Delhi	UG, PG, M.Phil., PhD	"Department of Library and Information Science"	"Faculty of Art"
Tribhuvan University	UG, PG	"Department of Library and Information Science"	"Faculty of Humanities and Social Science"
University of Karachi	PG, PG Diploma Course, MPhil, PhD	"Department of Library and Information Science"	"Faculty of Art"
University of Kelaniya	Diploma Courses, PG, M.Phil., PhD	"Department of Library and Information Science"	"Faculty of Social Sciences"

The data presented in table 2 provides an overview of the universities that were the first to introduce master's degree programmes in Library and Information Science (LIS) in their respective countries. It is observed that Bhutan, Maldives, and Afghanistan do not offer library education up to the master's degree level. However, all the universities mentioned in the table offer Ph.D. programmes as their highest degree programme, except for Tribhuvan University in Nepal, which offers M. Lib. Sc. (PG Course) as its highest degree programme. The department responsible for offering the LIS courses in all the universities is called the "Department of Library and Information Science," except for the University of Dhaka in Bangladesh, where it is known as the "Department of Information Science and Library Management." This distinction in department names indicates a potential variation in the curriculum and focus of the programmes.

It is worth noting that only the

University of Karachi and the University of Kelaniya offer postgraduate diploma courses in addition to the master's and Ph.D. programmes. The University of Kelaniya specifically offers a range of diploma courses, including an Advancement Certificate Diploma, Diploma in Public Librarianship, Diploma in School Librarianship, Postgraduate Diploma, and Postgraduate Diploma in Teacher Librarianship. Moreover, the University of Kelaniya also offers two master's degree programmes, namely Master in Teacher Librarianship and Master in Information Management, further emphasising its comprehensive offerings in library education.

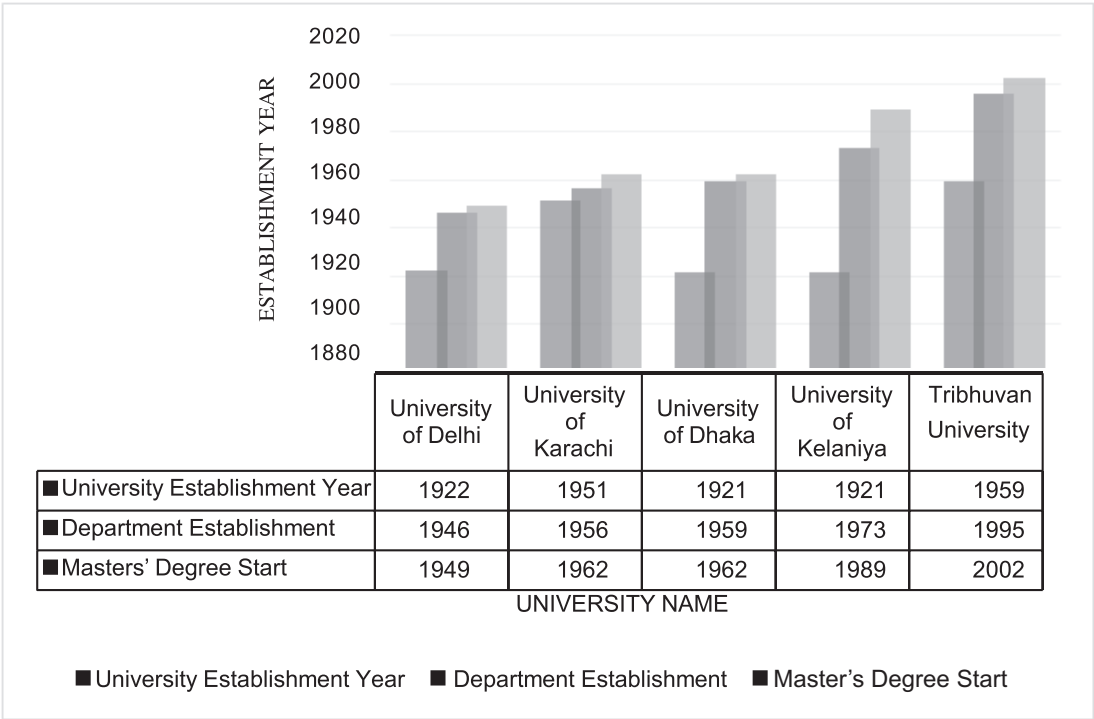

Figure 1 :Establishment year

Figure 1 illustrates that the University of Delhi (established in 1922) was the first university in the SAARC region to offer a master's degree in LIS in 1949, 27 years after its inception. In 1962, both the University of Dhaka and the University of Karachi initiated master's degree programmes in LIS. Tribhuvan University, founded in an even later year, began its master's programme in Library Science in 2002. This indicates a growing recognition of the significance of LIS education in the SAARC region, as another prominent university joined the ranks of institutions offering specialised programmes in the field.

Remarkably, the University of Karachi, established in 1951, demonstrated a swift response to the demand for library education. Only five years after its founding, the university began offering library education, and within a short span of six years, it upgraded its programme to a master's degree

in Library and Information Science. This data interpretation highlights the progressive development of LIS education in the SAARC region, with universities responding to the demand and evolving over time to meet the educational needs in the field of LIS.

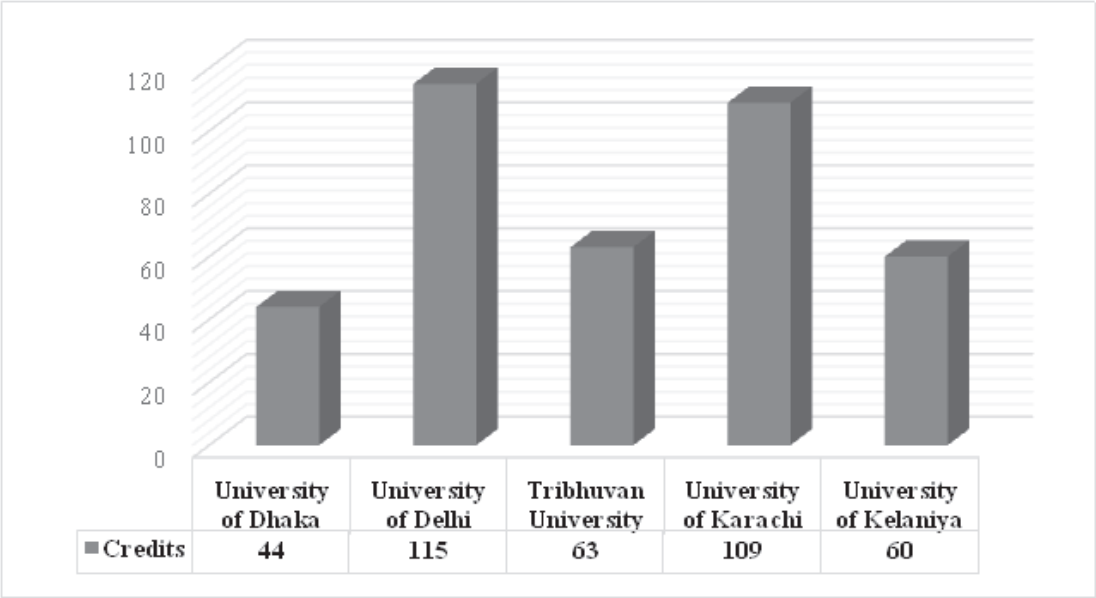

Figure 2: Course credits

The information presented in figure 2 reveals the variation in the number of credit hours required for completing a master's degree in LIS among the selected universities. The University of Delhi offers the highest number of credit hours for its master's programme in LIS, with a total of 115 credits. This indicates that students pursuing a master's degree at the University of Delhi are exposed to an extensive curriculum, covering a broad range of topics and subjects within the field of LIS. The University of Karachi follows closely behind, requiring 109 credits for its master's programme in LIS. This suggests that the University of Karachi also emphasises a comprehensive curriculum, providing students with an in-depth understanding of the discipline.

In contrast, the University of Dhaka requires the fewest credits for its master's degree in LIS, with only 44 credits. This implies that the programme at the University of Dhaka is relatively more focused or condensed, potentially providing a more specialised or streamlined approach to LIS education. The variation in credit hours among these universities highlights the differences in curriculum design and educational objectives. The University of Delhi and the University of Karachi prioritise a more extensive coverage of subjects, while the University of Dhaka focuses on a more concise programme. These differences in credit hours suggest diverse approaches to structuring and delivering LIS education among the selected universities.

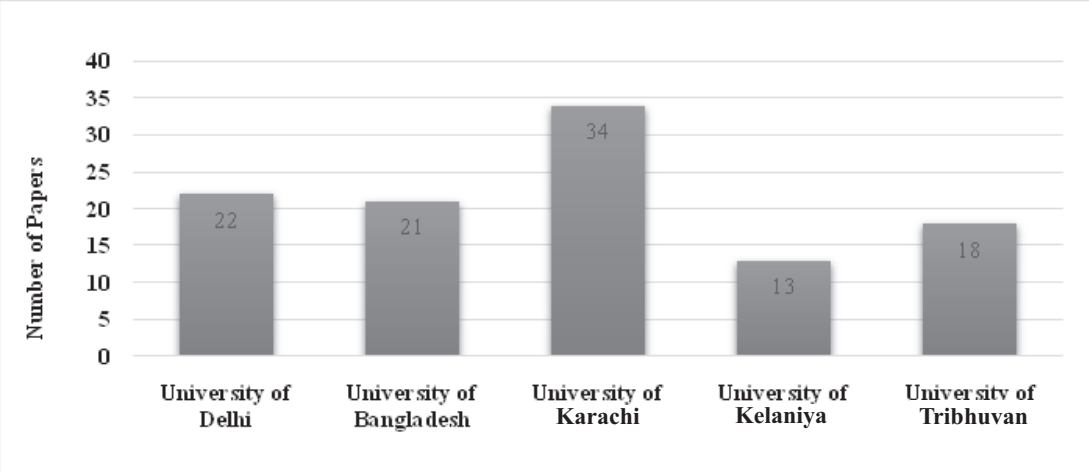

Figure: 3 Number of courses

Figure 3 indicates that the University of Karachi offers 34 subjects in its master's programme in LIS. The University of Delhi and the University of Bangladesh offer 22 and 21 papers, respectively. The University of Kelaniya offers the lowest number of courses (13).

Table 3: Course analysis

Name of the Core Courses	University of Delhi	University of Bangladesh	University of Karachi	University of Kelaniya	University of Tribhuvan	Total
Library Classification	1	1	1	1	1	**5**
Management of library & information centres	1	1	1	1	1	**5**
Information services & sources	1	1	1	1	1	**5**
Library Cataloguing	1	1	1	1	1	**5**
Research Methodology	1	1	1	1	1	**5**
Thesis	1	1	1	1	1	**5**
Basics of information technology in LIS	1	1	0	1	1	**4**
Information Storage and Retrieval System	1	1	1	0	1	**4**
Library and information society	1	0	1	0	1	**3**
Internship Programme	1	0	0	0	1	**2**
Vice- Voce	1	1	0	0	0	**2**
Information Literacy Applications in LIS	1	1	0	0	0	**2**
Digital Library Systems	1	1	0	0	0	**2**
Indexing and abstracting	0	1	1	0	0	**2**
History of Books and Library and Information Science	0	0	1	0	0	**1**
Management of Information Institutions	0	1	0	0	0	**1**
Communication Skill	0	0	1	0	0	**1**
Technical Writing	0	0	1	0	0	**1**
Internship	0	0	0	0	1	**1**
Information Sources and Literature of Islam	0	0	1	0	0	**1**
Total	**13**	**13**	**13**	**7**	**11**	**-**

The curriculum analysis for the core course (Master in Library Science) is shown in table 3. Among the core courses, it is observed that there are six subjects that are offered by all five universities, namely "Library Classification," "Management of Library & Information centers," "Information Services & Sources," "Library Cataloguing," "Research Methodology," and "Thesis." This indicates a shared emphasis on these subjects across all institutions, highlighting their importance in the LIS curriculum.

Additionally, four out of the five universities (University of Delhi, University of Bangladesh, University of Kelaniya, and University of Tribhuvan) offer the course "Basics of information technology in LIS," recognising the significance of technological aspects in the field. Similarly, "Information Storage and Retrieval System" is offered by four universities, except the University of Kelaniya.

There are variations in course offerings among the universities as well. Subjects such as "Library and Information Society," "Internship Programme," "Vice-Voce," "Information Literacy Applications in LIS," "Digital Library Systems," and "Indexing and Abstracting" are offered by varying numbers of universities, indicating differences in the priorities and curriculum design of each institution.

Furthermore, certain courses are offered by a limited number of universities or, in some cases, only by one university. Examples include "History of Books and Library and Information Science," "Management of Information Institutions," "Communication Skill," "Technical Writing," "Internship," and "Information Sources and Literature of Islam." These courses reflect specific areas of focus or regional considerations within the LIS education provided by the respective universities.

6. Findings and discussion

The following are the major findings of the present study:

- Out of the 8 SAARC countries, 5 offer master's programmes in LIS. Bhutan, the Maldives, and Afghanistan are the only ones that do not offer library education up to the master's level.
- The University of Delhi (established in 1922) was the first university in the SAARC region to offer a master's degree in Library Science in 1949.
- In 2002, Tribhuvan University launched its master's programme in Library Science.
- All of these universities except Tribhuvan University offer Ph.D. programmes as their highest degree programme.
- Tribhuvan University's highest degree programme is the Master of Library Science (Postgraduate Course).
- All of these courses are offered by the "Department of Library and Information Science," except at the University of Dhaka in Bangladesh, where the department is called the "Department of Information Science and Library Management."
- The post-graduate diploma courses are offered by the University of Karachi and the University of Kelaniya.
- The University of Karachi provides a variety of diploma programmes.
- The University of Karachi's master's programme in LIS has the most credit hours and the most courses.

- All universities offer the courses "Library Classification," "Management of Library & Information Science," "Information Services & Sources," "Library Cataloguing," "Research Methodology," and "Thesis."

7. Conclusion

The different variations found in conducting the LIS courses suggest in SAARC countries. Although the study further explores that some aspects in the courses are common across all institutions, highlighting their significance in LIS education, such as library classification, management of library and information centers, information services and sources, library cataloguing, research methodology, and thesis. Variation in course offerings among universities reflects diverse priorities and curriculum designs, with specific courses being offered by limited or specific institutions.

References

ACKU (2011).Rebuilding the libraries of Afghanistan. http://afghandata.org:8080/xmlui/bitstream/handle/20.500.12138/20093/azu_acku_pamphlet_z845_a3_r438_2011_w.pdf

Banks, J. A. (2010). Approaches to multicultural curriculum reform. In J. A. Banks & C. A. McGee Banks (Eds.), *Multicultural education: Issues and perspectives* (7th ed., pp. 247-267). Hoboken, NJ: Wiley & Sons.

Biswas, A. (2013). Accreditation of LIS education in India: formation of parameters in the lights of recommendations made by commissions and committees. *Calcutta University Journal of Information Studies (CUJIS),* 15, 145 -156. Retrieved from https://www.researchgate.net/publication/352780607_Accreditation_of_LIS_Education_in_India_Formation_of_Parameters_in_the_light_of_Recommendations_made_by_Commissions_and_Committees

Biswas, A., & Chakrabarti, B. (2014). Place of doctoral research in library and information science: looking back through the recommendations of commissions and committees in India. *Indian Journal of Library and Information Science,* 8 (3), 253 - 264.

Biswas, A. (2021). History of LIS education in India. Retrieved from https://www.researchgate.net/publication/351524079_Chapter_4_History_of_LIS_Education_in_India

Biswas, A. (2022). A comparative analysis of open government data initiatives in SAARC countries. In Biswas, Ashis & Das Biswas, Mayuri (Eds.), *Panorama of open access: progress, practices and prospects* (pp. 158 - 177). New Delhi : Ess Ess Publications. Retrieved from https://www.researchgate.net/publication/359511471_A_Comparative_Analysis_of_Open_Government_Data_Initiatives_in_SAARC_Countries

Clayton, M., & Williams, A. (2004). *Social justice.* Malden, MA: Blackwell.

Delhi University (14th Dec, 2022). Retrieved from http://dlis.du.ac.in/history.html

Delhi University (13th Dec, 2022). Retrieved from http://www.du.ac.in/index.php?page=about-du-2

Dhaka University (15th Dec, 2022). Retrieved from https://www.du.ac.bd/body/History/LIS

Dhaka University (15th Dec, 2022). Retrieved from https://www.du.ac.bd/body/History/LIS

Giroux, H. (1984). Teachers as transformative intellectuals. *Kaleidoscope: Contemporary and Classic Readings in Education,* 2(1), 11-22.

Jayasuriya, G. D. A., Riyaz, A., & Majid, S. (2021). A review of the library and information science profession in the Maldives: Development, Challenges and opportunities. *IFLA Journal,* 20(10),1-15.

Karachi University (14 Dec, 2022). Retrieved

from https://www.dlisuok.edu.pk/Histo.htm.

Karachi University (14th Dec, 2022). Retrieved from https://www.dlisuok.edu.pk/UoK.htm.

Karachi University (15th Dec, 2022). Retrieved from https://www.dlisuok.edu.pk/Cours.htm

Krishan Kumar & Sharma, J. (2010). Library and Information Science Education in India: A Historical Perspective. *DESIDOC Journal of Library & Information Technology,* 30(5), 3-8. https://doi.org/10.14429/djlit.30.5.610

Kumasi, K. D., & Manlove, N. L. (2015). Finding "Diversity Levers" in the Core Library and Information Science Curriculum: A Social Justice Imperative. *Library Trends,* 64(2), 415-443. https://doi.org/10.1353/lib.2015. 0047

Malik, A., & Ameen, K. (2017). Library/information education programs in Pakistan: a comparison with IFLA Guidelines. *Library Review,* 66(4/5), 297-309. https://doi.org/10.1108/LR-11-2016-0098.

Nepal National Library (2006).Nepal National Library Country Report. Retrieved from https://www.ndl.go.jp/en/cdnlao/meetings/pdf/CR2006_Nepal.pdf.

Ransom, S. (2011). Bhutan's first library qualification, background and development. *Education for Information,* 28(2/4), 165-173. https://doi.org/10.3233/EFI-2010-0899

Riyaz, A. et al. (2022). *Library and Information Science education and training opportunities in Bangladesh and Maldives: a comparison.* In Progress of Library and Information Services sector of the Maldives: Commemorating the 25th Anniversary of the Maldives Library Association (pp.107-134). Male', Maldives: MLA.

Tribhuvan University (12th Dec, 2022). Retrieved on https://tucdlis.edu.np/wp-content/uploads/2021/03/MLISc-curriculum2.pdf

Tribhuvan University (13th Dec, 2022). Retrieved from https://tucdlis.edu.np/abou9t-us/.

University of Kelaniya (12th Dec, 2022). Retrieved from https://fgs.kln.ac.lk/images/ProgramDetails/LISC/MA-Brochure-2018-new.pdf.

SVNN-Entropy Weighting Strategy (SVNN-EWS) for Popularity Ranking Factors in Library and Information System: a neutrosophic framework

Satyabrata Sahoo

Research Scholar, Department of Library and Information Science, University of Calcutta

Surapati Pramanik*

Assistant Professor, Nandalal Ghosh B. T. College, panpur, West Bengal, India
(* Corresponding Author)

Dr. Pijushkanti Panigrahi

Professor, Department of Library and Information Science, University of Calcutta

Abstract

Information Retrieval (IR) in Library and Information System (LIS) is not displayed in their search results as users like to see them in deserved order. It is happening because of the incorporation of a few numbers of ranking factors and the model is not user-centred. Consequently, problems with user satisfaction are continuously reported. There are six groups of ranking factors, namely, "Text Statistics, Popularity, Freshness, Locality and Availability, Content Properties, and User Background". The objectives of the study are to present the factors related to the ranking of search results in LIS, and to assign the weights of each factor of popularity group considering the experts' opinion using the entropy method in Single Valued Neutrosophic Numbers (SVNNs). A review of the concerned literature shows that there exists no such study that used the Entropy strategy in Information Retrieval (IR) in LIS and determine weights of the factors for ordering search results considering popularity ranking factors and on the other hand this is a user-centric approach. All these make the proposed study a novelty approach. The considered factors can be used in designing a ranking model for a LIS, designing Web-scale Discovery Tools (DT), or when discussing such a project with an Integrated Library Management System (ILMS) vendor.

Keywords: Entropy, Information retrieval, Multi criteria decision making, Neutrosophic set, Online public access catalogue, Ranking factors, Relevance ranking, Single-valued neutrosophic number

1. Introduction

The library software helps us to locate all kinds of collections of a traditional library, digital library, e-library, etc. through its Online Public Access Catalogue(OPAC) or web version of that which is known as Web-OPAC. There are so many free and open-source ILMS as well as a number of commercials too. But the search results of OPAC have some shortcomings related to user-centredness and lack of sophistication in presentation (Lewandowski, 2010). Today's Library and Information Systems consider very few factors as well as poor principles and

strategies to bring their search results in relevancy order which is why they are producing such poor results (Sahoo & Panigrahi, 2022). The best search results in a ranking done by web search engines may be a very much exemplary model for any other information system like a Library and Information System (LIS) to satisfy users and make the search results ordered maintaining relevancy. Search engine technologies have been used to meet the expectations of users in searching and retrieving information (Antelman, Lynema, & Pace, 2006; Connaway & Dickey, 2010; Breeding, 2006; Niu & Hemminger, 2010). Behnert and Lewandowski (2015) categorise all ranking factors (RF) related to or may be considered for LIS into six groups. Under each group, there are a number of factors that can be considered to rank library materials maintaining the relevancy order of search results. LIS use only a few in their system but for better results, we have to systematically test various factors for the best suited in the system. There exist no specific tools to satisfy all users in all aspects. Therefore, rethinking the factors, analysis of the ranking strategy, new algorithms, new framework are always needed. A new model is inevitable to achieve a more or less satisfactory level by the trial-and-error method (Sahoo & Panigrahi, 2022). There are a number of popularity factors suitable for LIS but here we have considered only ten (10) broad sub-groups under group popularity to show the practical exposure of how to incorporate those in the system.

Uncertainty involves in every sphere of real-life problems. To handle uncertainty Zadeh (1965) developed the Fuzzy Set (FS). Smarandache (1998) extended the FS to the Neutrosophic Set (NS) which is a generalisation of different types of FSs such as Intuitionistic FS (IFS), etc. Single-Valued NS (SVNS) (Wang et al., 2010) was grounded as a subclass of NS which is more popular in Multi-Criteria Decision Making (MCDM) (Khan et al., 2018) problems. However, fuzzy is concerned with capturing and conveying the vagueness of an abstract concept. Therefore, the reason for applying single-value dneutrosophic is easy to use in information processing and computational simplicity in linguistic preferences. Further Smarandache (2019) established that NS is the generalisation of Pythagorean FS (Yager, 2013), spherical FS (Kutlu Gündoğdu, & Kahraman, 2019), and q-rung orthopair FS (Yager, 2017). Also, Membership Function (MF), non-MF, and indeterminacy MF are independent in NS and NS is capable of dealing with inconsistency and indeterminacy. On the other hand, ranking factors inherently involve uncertainty, indeterminacy, and inconsistency. So, NS has advantages over other extensions of FSs for the present study.

NS was extended to Single Valued Quadripartitioned NS (SVQNS) (Chatterjee et al., 2016), interval quadripartitioned NS (IQNS) (Pramanik, 2022), Pentapartitioned NS (PNS) (Mallick and Pramanik, 2020), Interval PNS (Pramanik, in press) to capture uncertainty in a convincing way. Details of the development of neutrosophic theories and applications have been documented in the studies (Smarandache & Pramanik 2016, 2018; Pramanik, Mallick & Dasgupta, 2018; Peng 2020; Pramanik 2020, 2022).

As the neutrosophic environment is more realistic, we choose the Single Valued Neutrosophic Number (SVNN) environment for the present investigation. In this environment, we combine the entropy strategy and group decision-making. The entropy strategy is used to assign weights to the factors based on the opinions of the subject experts cum users. We apply the SVNN

Weighted Averaging Aggregation (SVNNWAA) operator (Ye, 2014) to aggregate the decision matrices.

In the real world, the DM sprefer to evaluate the importance of attributes in a flexible way by utilising linguistic variables. The reason behind it is the partial knowledge about the criteria, unfamiliar domains, expertise, etc. We have developed the framework based on the opinion of the user (user-centric approach) and SVNS theory which is more capable to reflect reality than the traditional approaches.

2. Review of the literature related to the study

Literature reviews have been done on library materials ranking factors, popularity group ranking factors, SVNS, the process of assigning weights to the criteria, and the entropy strategy. Freshness was the most-used ranking criterion (Lewandowski, 2009) in catalogues. For a real ranking (Dellit & Boston, 2007), OPACs usually employ only standard text matching. Besides text matching, there are some other ideas that may be considered to improve the relevance ranking. Flimm (2007) proposed popularity ranking factors in catalogues for relevance ranking. According to Mercun and Zumer (2008) and Sadeh (2007) ranking search results in the LIS include "circulation statistics, book review data, the number of downloads, and the number of print copies owned by the institutions" (Lewandowski, 2009).

It may happen that users are not interested or they are not able to look through the whole result sets. So, superiority in ranking order reduces to a critical feature (Lewandowski, 2009). Behnert and Lewandowski (2015) categorised all RFs into six groups namely, "text statistics, popularity, freshness, locality & availability, content properties, and user background". Plassmeier et al. (2016) considered citation counts, usage data, and author metrics in their study and also opined that in future studies, all other popularity group factors should be included for a complete relevance model. Bornmann, Mutz, and Daniel (2008) mentioned that the h-index and m-index are more important to reflect the impact of the work of a researcher. The Characteristic Scores and Scales (CSS) strategy helps in finding the characteristic partitions for citation distributions of papers (Glanzel & Schubert, 1988). Plassmeier et al. (2016) stated that "the effectiveness of CSS scores as utilities in the overall relevance model must still be evaluated in user studies".

Various criterion weighting procedures have been established in the literature (Peng, 2020) for the MCDM process such as CRITIC (Diakoulaki et al., 1995), Entropy Weight Method(EWM) (Zou et al., 2006; Liu et al., 2010), maximising deviation method (Wu & Chen, 2007), optimisation method (Wang & Zhang, 2009; Biswas, Pramanik & Giri, 2014). The EWM in the SVNN environment (Majumder & Samanta, 2014) was used by Biswas, Pramanik and Giri (2014) to determine the unknown attribute weights in MCDM problems.

Attia, Gadallah, and Hefny (2014) presented an enhanced multi-view fuzzy IR model based on linguistics. Gupta, Saini, and Saxena (2015) developed the fuzzy ranking function for IR system. Alhabashneh, Iqbal, Doctor, and James (2017) presented the fuzzy-based approach using relevance feedback. Jain, Seeja, and Jindal (2021) presented the fuzzy ontology-based Information Retrieval (IR) framework. Ibrihicha, Oussousb, Ibrihicha, and Esghi (2022) presented a survey on IR basics and discussed the different approaches but did not

include the fuzzy and neutrosophic based approaches in their study. Sinha and Kumar (2020) presented a neutrosophic model for Healthcare Information Retrieval (HIR) that was an improvement over the fuzzy models. But it considered only Term Frequency (TF) and Inverse Document Frequency (IDF) as RFs.

It is observed that no research work has been developed to use an entropy strategy for IR model in an SVNN environment to incorporate RFs considered for the relevance ranking of search results in LIS.

3. Objectives of the study

The main objectives are mentioned below:

- to study the feasibility of entropy strategy for SVNN environment in LIS information searching
- to design a framework for calculating weights of the ranking factors in IR using the SVNN-Entropy Weighting Strategy (SVNN-EWS).

4. Methodology

The research has been done using review of the relevant documents to obtain ranking factors under group popularity so far identified and also applicable for LIS searching by researchers. A questionnaire has been prepared to collect the opinions of the experts who are also users of the system. The opinion was collected on five-point Likert scale (see Table 1). All the collected data have been put in the tabulated form and then converted the data into SVNNs. A new model, namely SVNN-EWS for determining the weights of RFs was devised using neutrosophic weighting technique (Biswas, Pramanik, & Giri, 2016) and the entropy of NSs (Majumdar & Samanta, 2014).

5. Preliminaries of SVNSs (Wang et al., 2010)

An SVNS σ in a universal set Ξ is characterised by a truth MF $\ddot{t}_\sigma(\ddot{x})$, an indeterminacy MF $\ddot{i}_\sigma(\ddot{x})$, and a falsity MF $\ddot{f}_\sigma(\ddot{x})$ with $\ddot{t}(\ddot{x}), \ddot{i}_\sigma(\ddot{x}), \ddot{f}_\sigma(\ddot{x}) \in [0,1], \forall \ddot{x} \in \Xi$.

When, Ξ is continuous, an SVNS σ can be presented as:

$$\sigma = \int_{\ddot{x}} \left\langle \ddot{t}_\sigma(\ddot{x}), \ddot{i}_\sigma(\ddot{x}), \ddot{f}_\sigma(\ddot{x}) \right\rangle / \ddot{x}, \forall \ddot{x} \in \Xi$$

and when Ξ is discrete, an SVNS σ can be presented as:

$$\sigma = \sum \left\langle \ddot{t}_\sigma(\ddot{x}), \ddot{i}_\sigma(\ddot{x}), \ddot{f}_\sigma(\ddot{x}) \right\rangle / \ddot{x}, \forall \ddot{x} \in \Xi$$

with $0 \le \sup \ddot{t}_\sigma(\ddot{x}) + \sup \ddot{i}_\sigma(\ddot{x}) + \ddot{f}_\sigma(\ddot{x}) \le 3, \forall \ddot{x} \in \Xi$

Therefore,

$0 \le \sup \ddot{t}_\sigma(\ddot{x}) + \sup \ddot{i}_\sigma(\ddot{x}) + \ddot{f}_\sigma(\ddot{x}) \le 3$.

For convenience, the triplet

$\left\langle \ddot{t}_\sigma(\ddot{x}), \ddot{i}_\sigma(\ddot{x}), \ddot{f}_\sigma(\ddot{x}) \right\rangle$

is called an SVNN and presented as

$\left\langle \ddot{t}_\sigma, \ddot{i}_\sigma, \ddot{f}_\sigma \right\rangle$.

Let $\kappa_1 = \langle d_1, e_1, f_1 \rangle$ and $\bar{\kappa}_1 = \langle \bar{d}_1, \bar{e}_1, \bar{f}_1 \rangle$

be any two SVNNs with

$d_1, e_1, f_1, \bar{d}_1, \bar{e}_1, \bar{f}_1 \in [0,1]$,

$(d_1 + e_1 + f_1) \in [0,3]$ and $(\bar{d}_1 + \bar{e}_1 + \bar{f}_1) \in [0,3]$

Then, the operations for SVNNs (Broumi et al., 2018) are presented as follows;

i. $\kappa_1 \oplus \bar{\kappa}_1 = \langle d_1 + \bar{d}_1 - d_1\bar{d}_2, e_1\bar{e}_1 f_1\bar{f}_1 \rangle$ [Summation] (1)

ii. $\kappa_1 \otimes \bar{\kappa}_1 = \langle d_1\bar{d}_1, e_1 + \bar{e}_1 - e_1\bar{e}_1, f_1 + \bar{f}_1 - f_1\bar{f}_1 \rangle$ [Multiplication] (2)

iii. $c\kappa_1 = \langle 1-(1-d_1)^c, e_1^c, f_1^c \rangle, c > 0$ [Scalar multiplication] (3)

iv. $\kappa_1^c = \langle d_1^c, 1-(1-e_1)^c, 1-(1-f_1)^c \rangle, c > 0$ (4)

6. SVNN -Entropy Weighting Strategy

Formulate a committee of P (≥ 2) DMs. P number of DMs evaluate the alternative Ar (r= 1, 2, …, m), (m ≥ 2) with respect to n criteria F_s(s=1,2,…, n), (n ≥ 2). SVNN-EWS is developed using the following steps (See Fig.1).

Step 1: Construction of the decision matrices

Suppose that $Q^P = (g^P_{rs})_{m\times n}$ is the p[th] decision matrix where information about the alternative A_r is given by the p[th] DM subject to the criterion F_s is a linguistic variable λ^p_{rs}. This linguistic variable can be transformed into SVNN (see table 1). After converting the linguistic variable into SVNN rating values, the p[th] decision matrix is constructed as follows:

$$G^p = (g^p_{rs})_{m\times n} = \begin{pmatrix} g^p_{11} & g^p_{12} & \cdots & g^p_{1n} \\ g^p_{21} & g^p_{22} & \cdots & g^p_{2n} \\ \vdots & \vdots & \cdots & \vdots \\ g^p_{m1} & g^p_{m2} & \cdots & g^p_{mn} \end{pmatrix} \quad (5)$$

where $g^p_{rs} = \langle a^p_{rs}, b^p_{rs}, c^p_{rs} \rangle$

where p=1, 2, … P., r = 1, 2, …, m & s = 1, 2, …, n

Table 1. Linguistic terms for weighting of attributes and decision makers and rating alternatives (Biswas et al., 2016)

Linguistic terms	SVNNs
Extremely Important (EI)	⟨0.90,0.10,0.10⟩
Very Important (VI)	⟨0.80,0.20,0.15⟩
Important (I)	⟨0.50,0.40,0.45⟩
Very Unimportant (VU)	⟨0.35,0.60,0.70⟩
Extremely Unimportant (EU),	⟨0.10,0.80,0.90⟩

Step 2: Normalise the decision matrices

Normalisation is done using the rule (Biswas et al., 2016) (Eqn. 6)

$$d^p_{rs} = \begin{cases} g^p_{rs}, \text{for benefit critrion} \\ (g^p_{rs})', \text{for cos t criterion} \end{cases} \quad (6)$$

and the matrix G^p is converted into the matrix

$D^p_{rs} = (d^p_{rs})_{m\times n}$ where $(g^p_{rs})' = (c^p_{rs}, 1-b^p_{rs}, a^p_{rs})$ is the complement of SVNN

$g^p_{rs} = \langle a^p_{rs}, b^p_{rs}, c^p_{rs} \rangle$.

Then the normalised decision matrix appears of the form:

$$D^p = \begin{pmatrix} d^p_{11} & d^p_{12} & \cdots & d^p_{1n} \\ d^p_{21} & d^p_{22} & \cdots & d^p_{2n} \\ \vdots & \vdots & \vdots & \vdots \\ d^p_{m1} & d^p_{m2} & \cdots & d^p_{mn} \end{pmatrix}, \text{p= 1, 2, ..., P.} \quad (7)$$

Step 3: Calculate the weights of the DMs

Assume that $\varphi_p = \langle T_p(\omega), I_p(\omega), F_p(\omega) \rangle$ is rating for the p-th DM. Then, φ_p, weight of the p[th]

$$DM = \frac{1-\sqrt{\{(1-T_p(\omega))^2 + (I_p(\omega))^2 + (F_p(\omega))^2\}/3}}{\sum_{p=1}^{P}(1-\sqrt{\{(1-T_p(\omega))^2 + (I_p(\omega))^2 + (F_p(\omega))^2\}/3})} \quad (8)$$

and $$\sum_{p=1}^{P} \varphi_p = 1 \quad (9)$$

Step 4: Aggregate the decision matrices

Utilising

$$D^p_{rs} = (d^p_{rs})_{m\times n}, \quad \varphi = (\varphi_1, \varphi_2, ..., \varphi_P)^T,$$

$$\varphi_p \in [0,1] \quad \text{and} \quad \sum_{p=1}^{P} \varphi_p = 1,$$

the Aggregated Decision Matrix (ADM) *D'* is obtained by employing the SVNWAA operator (Ye, 2014) for SVNNs as follows:

$$\begin{aligned} &SVNWAA_{\varphi}(d_{rs}^{1}, d_{rs}^{2}, ..., d_{rs}^{P}) \\ &= \varphi_1 d_{rs}^{1} \oplus \varphi_2 d_{rs}^{2} \oplus ... \oplus \varphi_P d_{rs}^{P} \\ &= \left\langle 1 - \prod_{p=1}^{P} (1 - T_{rs}^{(p)})^{\varphi_p}, \prod_{p=1}^{P} (I_{rs}^{(p)})^{\varphi_p}, \prod_{p=1}^{P} (F_{rs}^{(p)})^{\varphi_p} \right\rangle \end{aligned} \quad (10)$$

The ADM is obtained as:

$$D' = (\delta'_{rs})_{m \times n} = \begin{pmatrix} \delta'_{11} & \delta'_{12} & \dots & \delta'_{1n} \\ \delta'_{21} & \delta'_{22} & \dots & \delta'_{2n} \\ \vdots & \vdots & \vdots & \vdots \\ \delta'_{m1} & \delta'_{m2} & \dots & \delta'_{mn} \end{pmatrix} \quad (11)$$

where $\delta'_{rs} = \langle T'_{rs}, I'_{rs}, F'_{rs} \rangle$. (12)

Step 5: Determine the weights of the attributes

The entropy value (Majumder & Samanta, 2014) E_s of the s^{th} attribute F_s(s=1, 2, …, n), is obtained using the formula

$$E_s = 1 - \frac{1}{n} \sum_{r=1}^{m} (T'_{rs} + F'_{rs})(I_{rs} - I'_{rs}) \quad (13)$$

For r=1, 2,…, m; s=1, 2,…,n.

The entropy weight (Hwang & Yoon, 1981; Wang & Zhang, 2009) ω_s of the s-th attribute F_s is presented by

$$\omega_s = \frac{1 - E_s}{\sum_{s=1}^{n} (1 - E_s)} \quad (14)$$

We obtain the weight vector

$$\omega = (\omega_1, \omega_2, .., \omega_n)' \text{ with } \omega_s \in [0,1] \text{ and } \sum_{s=1}^{n} \omega_s = 1.$$

Step 6: Rank the attributes

Now finally we obtain the weights of the attributes. The attributes are arranged in descending order.

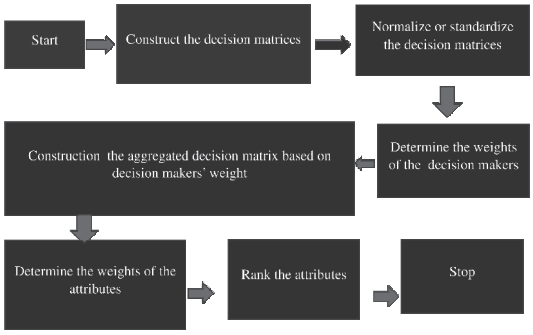

Fig.1: Flowchart of the SVNN-EWS

7. Data, calculations and results

We have considered five experts cum users as decision maker (DM1, DM2 ,DM3, DM4,DM5) in the study. At first, we have elaborately defined the objectives of the study to the experts. Then briefly explained the definition, scope and coverage of all criterion. Five DMs have given their opinion about the importance of each particular ranking factors under the group popularity mentioned in the questionnaire on the basis of five-point Likert scale. The factors are Subject (F1), Circulation (F2), Language (F3), Number of published edition (F4), Number of Copies (F5), Bibliometric Methods (F6), Publisher Authority (F7), Purchasing Behaviour (F8), Ratings (F9) and Enriched Metadata (F10). The factors are related to the documents denoted as A1 , A2 , A3, A4 and we have designed a framework to determine the weights of the attributes. The weights of five DMs may not be the same as far as their status is concerned. In table 1, weights of the DM are expressed in linguistic terms. The importance

of each DM is expressed by linguistic terms with its corresponding SVNNs (see table 2). The opinions of the DMs are shown table 3 to table 7.

Table 2: Importance of Decision Makers expressed with SVNNs

Decision Maker (DM)	**DM1**	**DM2**	**DM3**	**DM4**	**DM5**
Likert Scale	EI	VI	VI	EI	EI
SVNNs	⟨0.90,0.10,0.10⟩	⟨0.80,0.20,0.15⟩	⟨0.80,0.20,0.15⟩	⟨0.90,0.10,0.10⟩	⟨0.90,0.10,0.10⟩

Table 3: Decision matrix $P^{(1)}$

A_i	F_1	F_2	F_3	F_4	F_5	F_6	F_7	F_8	F_9	F_{10}
A_1	VI	VI	VI	VI	VI	VI	VI	VI	EI	EI
A_2	EI	VI	I	EI	VI	VI	VI	EI	I	VU
A_3	VI	VI	VI	VU	VI	VU	I	I	I	I
A_4	VI	VI	VI	VI	VI	VI	VU	VU	I	I

Table 4: Decision matrix $P^{(2)}$

A_i	F_1	F_2	F_3	F_4	F_5	F_6	F_7	F_8	F_9	F_{10}
A_1	VI	VU	I	I	I	I	EI	I	EI	VI
A_2	VI	I	VU	I	VI	VI	VI	I	VI	VI
A_3	I	I	I	VI	VI	I	I	VU	I	VI
A_4	VI	VI	VI	VU	VU	VU	VU	VI	VU	I

Table 5: Decision matrix $P^{(3)}$

A_i	F_1	F_2	F_3	F_4	F_5	F_6	F_7	F_8	F_9	F_{10}
A_1	VI	I	VU	I	I	I	VI	I	VI	VI
A_2	VI	VI	VI	I	VI	I	I	VI	VI	VI
A_3	I	VI	VI	VI	VI	VI	I	I	I	I
A_4	VI	I	I	VU	I	VI	VU	I	I	VI

Table 6: Decision matrix $P^{(4)}$

A_i	F_1	F_2	F_3	F_4	F_5	F_6	F_7	F_8	F_9	F_{10}
A_1	VI	VI	VI	VI	I	VI	VI	I	EI	EI
A_2	I	I	VI	EI	VI	I	I	VI	VI	VI
A_3	VI	VI	I	I	I	I	VI	EI	I	I
A_4	I	VI	VI	I	EI	VI	I	I	EI	I

Table 7: Decision matrix $P^{(5)}$

A_i	F_1	F_2	F_3	F_4	F_5	F_6	F_7	F_8	F_9	F_{10}
A_1	VI	I	VI	VU	VI	VI	I	EI	I	VI
A_2	I	VI	VU	I	VI	VU	VU	I	VI	I
A_3	I	I	I	I	I	I	I	I	I	I
A_4	VI	VI	VI	VI	VI	VI	VI	VI	VU	VU

Step 1: Construction of the decision matrices

$$\begin{matrix} A_1 \\ A_2 \\ A_3 \\ A_4 \end{matrix}\begin{pmatrix} \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.90,0.10,0.10\rangle & \langle 0.90,0.10,0.10\rangle \\ \langle 0.90,0.10,0.10\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.90,0.10,0.10\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.90,0.10,0.10\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.35,0.60,0.70\rangle \\ \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.35,0.60,0.70\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.35,0.60,0.70\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle \\ \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.35,0.60,0.70\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle \end{pmatrix}$$

$$\begin{matrix} A_1 \\ A_2 \\ A_3 \\ A_4 \end{matrix}\begin{pmatrix} \langle 0.80,0.20,0.15\rangle & \langle 0.35,0.60,0.70\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.90,0.10,0.10\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.90,0.10,0.10\rangle & \langle 0.80,0.20,0.15\rangle \\ \langle 0.80,0.20,0.15\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.35,0.60,0.70\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle \\ \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.35,0.60,0.70\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.80,0.20,0.15\rangle \\ \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.35,0.60,0.70\rangle & \langle 0.35,0.60,0.70\rangle & \langle 0.35,0.60,0.70\rangle & \langle 0.35,0.60,0.70\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.35,0.60,0.70\rangle & \langle 0.50,0.40,0.45\rangle \end{pmatrix}$$

$$\begin{matrix} A_1 \\ A_2 \\ A_3 \\ A_4 \end{matrix}\begin{pmatrix} \langle 0.80,0.20,0.15\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.35,0.60,0.70\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle \\ \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle \\ \langle 0.50,0.40,0.45\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle \\ \langle 0.80,0.20,0.15\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.35,0.60,0.70\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.35,0.60,0.70\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.80,0.20,0.15\rangle \end{pmatrix}$$

$$\begin{matrix} A_1 \\ A_2 \\ A_3 \\ A_4 \end{matrix}\begin{pmatrix} \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.90,0.10,0.10\rangle & \langle 0.90,0.10,0.10\rangle \\ \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.90,0.10,0.10\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle \\ \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.90,0.10,0.10\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle \\ \langle 0.50,0.40,0.45\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.90,0.10,0.10\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.90,0.10,0.10\rangle & \langle 0.50,0.40,0.45\rangle \end{pmatrix}$$

$$\begin{matrix} A_1 \\ A_2 \\ A_3 \\ A_4 \end{matrix}\begin{pmatrix} \langle 0.80,0.20,0.15\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.35,0.60,0.70\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.90,0.10,0.10\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.80,0.20,0.15\rangle \\ \langle 0.50,0.40,0.45\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.35,0.60,0.70\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.35,0.60,0.70\rangle & \langle 0.35,0.60,0.70\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.50,0.40,0.45\rangle \\ \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle & \langle 0.50,0.40,0.45\rangle \\ \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.80,0.20,0.15\rangle & \langle 0.35,0.60,0.70\rangle & \langle 0.35,0.60,0.70\rangle \end{pmatrix}$$

Step 2: Normalisation of the matrices

All the criteria are benefit type. So, no need to normalise them.

Step 3: Calculate the weights of the DMs

According to the equation (13) we obtain the weights of the decision makers (see table 8):

Table 8: Weight of the decision makers

Decision Maker	φ_1	φ_2	φ_3	φ_4	φ_5
Weight	0.2078	0.1882	0.1882	0.2078	0.2078

Step 4: Construction of the aggregated decision matrix

By using Eq. (10), the aggregated value of the five decision makers' assessment values is arbitrarily chosen as an illustration for the alternative A1 with respect to the attribute F1 and shown in Eqs. (15), (16), and (17).

$$T_{11}=1-(1-0.80)^{0.2078}\times(1-0.80)^{0.1882}\times(1-0.80)^{0.1882}\times(1-0.80)^{0.2078}\times(1-0.80)^{0.2078}$$

$$=0.8 \qquad (15)$$

$$I_{11}=(0.20)^{0.2078}\times(0.20)^{0.1882}\times(0.20)^{0.1882}\times(0.20)^{0.2078}\times(0.20)^{0.2078}$$

$$=0.2 \qquad (16)$$

$$F_{11}=(0.15)^{0.2078}\times(0.15)^{0.1882}\times(0.15)^{0.1882}\times(0.15)^{0.2078}\times(0.15)^{0.2078}$$

$$=0.15 \qquad (17)$$

$$\begin{matrix} A_1 \\ A_2 \\ A_3 \\ A_4 \end{matrix}\begin{pmatrix} \langle 0.80,0.20,0.15\rangle & \langle 0.64,0.32,0.31\rangle & \langle 0.7,0.28,0.25\rangle & \langle 0.64,0.33,0.31\rangle & \langle 0.66,0.3,0.29\rangle & \langle 0.72,0.26,0.23\rangle & \langle 0.79,0.2,0.17\rangle & \langle 0.7,0.26,0.26\rangle & \langle 0.84,0.15,0.15\rangle & \langle 0.85,0.15,0.13\rangle \\ \langle 0.75,0.23,0.22\rangle & \langle 0.71,0.26,0.23\rangle & \langle 0.61,0.36,0.35\rangle & \langle 0.74,0.23,0.24\rangle & \langle 0.8,0.2,0.15\rangle & \langle 0.63,0.33,0.32\rangle & \langle 0.63,0.33,0.32\rangle & \langle 0.75,0.23,0.21\rangle & \langle 0.76,0.23,0.19\rangle & \langle 0.69,0.29,0.26\rangle \\ \langle 0.66,0.3,0.29\rangle & \langle 0.71,0.26,0.23\rangle & \langle 0.65,0.31,0.29\rangle & \langle 0.63,0.34,0.33\rangle & \langle 0.71,0.27,0.24\rangle & \langle 0.56,0.38,0.4\rangle & \langle 0.59,0.35,0.36\rangle & \langle 0.62,0.32,0.36\rangle & \langle 0.5,0.4,0.45\rangle & \langle 0.58,0.35,0.37\rangle \\ \langle 0.76,0.23,0.19\rangle & \langle 0.76,0.23,0.18\rangle & \langle 0.76,0.23,0.18\rangle & \langle 0.62,0.35,0.34\rangle & \langle 0.74,0.24,0.23\rangle & \langle 0.75,0.25,0.2\rangle & \langle 0.52,0.44,0.46\rangle & \langle 0.65,0.3,0.29\rangle & \langle 0.6,0.35,0.39\rangle & \langle 0.56,0.38,0.4\rangle \end{pmatrix}$$

Step 5: Calculate the weights of the attributes

To determine the weights of 10 attributes, we calculate the entropy value of each attribute using the formula (13) . The entropy values are presented in table 9.

Table 9: Entropy value for attributes

E_1	E_2	E_3	E_4	E_5	E_6	E_7	E_8	E_9	E_{10}
0.8013	0.8248	0.8448	0.8553	0.8109	0.8516	0.8698	0.8292	0.8307	0.8400

After calculating the entropy values of all ten attributes, we calculate the weight of each attribute using the formula (14) (see table 10).

Table 10: Attribute weight calculated according to entropy strategy (1st Case)

ω	W_1	W_2	W_3	W_4	W_5	W_6	W_7	W_8	W_9	W_{10}
Value	0.1210	0.1067	0.0945	0.0882	0.1152	0.0904	0.0793	0.1040	0.1031	0.0975
Position	1st	3rd	7th	9th	2nd	8th	10th	4th	5th	6th

In table 11, the sensitivity analysis is shown between the weights of the DMs, weights of the RFs and their ranking.

Table 11: Assigning of DMs'weight and corresponding weight of RFs and their ranking.

Weights of DMs / Weights of RFs			W	ei	W3	W4	W5	W6	W7	W8	W9	W10
1st Case	DM1	0.2078	0.1210	0.1067	0.0945	0.0882	0.1152	0.0904	0.0793	0.1040	0.1031	0.0975
	DM2	0.1882										
	DM3	0.1882										
	DM4	0.2078										
	DM5	0.2078										
	Ranking order of RFs		1st	3rd	7th	9th	2nd	8th	10th	4th	5th	6th
2nd Case	DM1	0.2	0.1207	0.1063	0.0954	0.0890	0.1152	0.0905	0.0793	0.1037	0.1023	0.0976
	DM2	0.2										
	DM3	0.2										
	DM4	0.2										
	DM5	0.2										
	Ranking order of RFs		1st	3rd	7th	9th	2nd	8th	10th	4th	5th	6th
3rd Case	DM1	0.1	0.1288	0.1007	0.0923	0.0781	0.1088	0.0924	0.0849	0.0905	0.1042	0.1192
	DM2	0.35										
	DM3	0.35										
	DM4	0.1										
	DM5	0.1										
	Ranking order of RFs		1st	5th	7th	10th	3rd	6th	9th	8th	4th	2nd
4th Case	DM1	0.185	0.1209	0.1046	0.0954	0.0887	0.1144	0.0905	0.0798	0.1040	0.1021	0.0996
	DM2	0.2225										
	DM3	0.2225										
	DM4	0.185										
	DM5	0.185										
	Ranking order of RFs		1st	3rd	7th	9th	2nd	8th	10th	4th	5th	6th
5th Case	DM1	0.3	0.1186	0.114	0.1033	0.0968	0.1071	0.0908	0.0645	0.1178	0.1048	0.0823
	DM2	0.05										
	DM3	0.05										
	DM4	0.3										
	DM5	0.3										
	Ranking order of RFs		1st	3rd	6th	7th	4th	8th	10th	2nd	5th	9th
6th Case	DM1	0.25	0.1220	0.1123	0.1008	0.0964	0.1072	0.0913	0.0623	0.1108	0.1057	0.0913
	DM2	0.125										
	DM3	0.125										
	DM4	0.25										
	DM5	0.25										
	Ranking order of RFs		1st	2nd	6th	7th	4th	8th	10th	3rd	5th	9th

Step 6: Arrange the attributes in descending order

Now finally we obtain the weights of the factors and are arranged considering the weight (ω_s) in descending order we get

$$F_1>F_5>F_2>F_8>F_9>F_{10}>F_3>F_6>F_4>F_7.$$

7.1 Sensitivity analysis

If the weights of the DMs have been changed, then it impacts (See Fig. 2 and Table 11) the ranking of RFs. If equal weights are considered for the DMs (2nd Case), then we see that the ranking order of the RFs remains unchanged. However, when (3rd Case) the 2nd and 3rd DMs are considered greater weights (0.35,0.35) than less weights for the 1st, 4th and 5th DMs (0.1, 0.1, 0.1), we see that ranking order is changed but the 1st position remains unchanged. The same trend of results has been observed in 4th case also. On the other hand (5th and 6th Case), when the 1st , 4th and 5th DMs' weights are considered greater (0.3, 0.3, 0.3) than other two DMs (0.05, 0.05), the order of the RFs' changed but the 1st position remains unchanged.

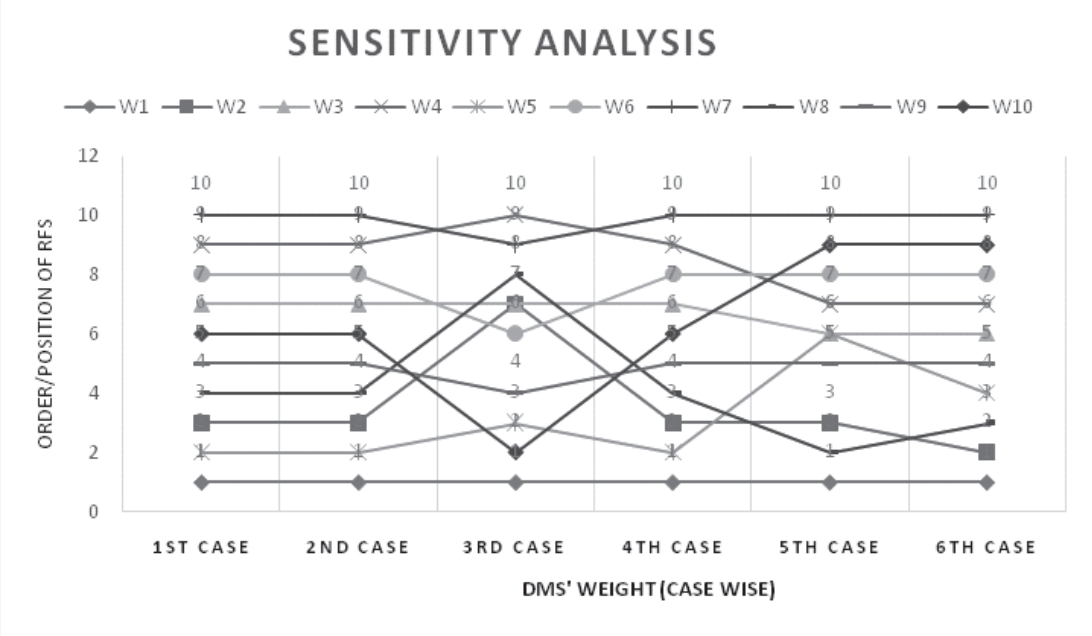

Fig. 2 : Sensitivity analysis of the decision makers' weights

Strength of the study: The proposed framework is capable of dealing with neutrosophic information. It has a tremendous capacity to incorporate numerous ranking factors from different stakeholders of IR like document, information seekers, tools, and social networks etc.

8. Conclusion

This paper develops the SVNN-Entropy Weighting Strategy using the SVNNWAA operator in SVNN settings. The paper presents the ranking factors under group popularity and assigns weight to each

individual ranking factor based on assessments of experts cum users using the entropy strategy. Here, we have proposed a framework to incorporate the factors after assigning weights. SVNN-EWS is the first approach in the field of information retrieval to consider SVNN environment with modern practices.

8.1 Limitations

For a large number of data, manual system will not perform well. The ranking factors are not easily understandable by the respondents.

8.2 Future scope of the study

Artificial Intelligence (AI) can be employed to collect and manage all the aspects of the proposed framework. More RFs can be incorporated for exhaustive model. It is also helpful when designing a ranking model for a library and information system (LIS), designing discovery tools, or discussing with an ILMS vendor.

References

Alhabashneh, O., Iqbal, R., Doctor, F., & James, A. (2017). Fuzzy rule based profiling approach for enterprise information seeking and retrieval. *Information Sciences,* 394-395, 18-37.

Antelman, K., Lynema, E., & Pace, A. K. (2006) Toward a twenty-first century library catalogue. *Information Technology & Libraries,* 25(3), 128-139.

Atanossov, K.T. (1986). Intuitionistic fuzzy sets. *Fuzzy Sets & System,* 20, 87-96.

Attia, Z. E., Gadallah, A. M., & Hefny, H. M. (2014). An enhanced multi-view fuzzy information retrieval model based on linguistics. *IERI Proc.* 7, 90-95.

Behnert, C., & Lewandowski, D. (2015) Ranking search results in the library information systems-considering ranking approaches adapted from web search engines. *The Journal of Academic Librarianship,* 41(6) 725-735.

Biswas, P, Pramanik, S., & Giri, B.C. (2014). Entropy based grey relational analysis method for multi-attribute decision making under single valued neutrosophic assessments. *Neutrosophic Sets and Systems,* 2, 102-110. doi.org/10.5281/zenodo.571510

Biswas, P., Pramanik, S., & Giri, B.C. (2014). A new methodology for neutrosophic multi-attribute decision-making with unknown weight information. *Neutrosophic Sets and Systems,* 3, 42-50.

Biswas, P., Pramanik, S., & Giri, C. (2016). TOPSIS method for multi-attribute group decision -making under single-valued neutrosophic environment. *Neural Computing and Applications,* 27(3), 727-737.

Bornmann, L., Mutz, R., & Daniel, H. D. (2008). Are there better indices for evaluation purposes than the h index? A comparison of nine different variants of the h index using data from biomedicine. *Journal of the American Society for Information Science and Technology,* 59(5), 830-837.

Breeding, M.(2006). Technology for the next generation. *Computers in Libraries,* 26(10), 28-30.

Broumi, S., Bakali, A., Talea, M., Smarandache, F., Uluçay, V., Sahin, S., Dey, A., Dhar, M., Tan, R. P., de Oliveira, A., &Pramanik, S. (2018). Neutrosophic sets: An overview. In F. Smarandache, & S. Pramanik (Eds., vol.2), *New trends in neutrosophic theory and applications* (pp. 403-434). Brussels: Pons Editions.

Chatterjee, R., Majumdar, P., & Samanta, S. K. (2016). On some similarity measures and entropy on quadripartitioned single valued neutrosophic sets. *Journal of Intelligent & Fuzzy System,* 30, 2475-2485.

Connaway, L. S., & Dickey, T. J. (2010). The digital information seeker: report of findings from selected OCLC, RIN and JISC user behaviour projects, OCLC Research.

Dellit, A., & Boston, T. (2007). Relevance ranking of results from MARC-based catalogs: from guidelines to implementation exploiting structured metadata. *National Library of Australia Staff Papers,* 1-14.

Diakoulaki, D. ,Mavrotas, G., & Papayannakis, L. (1995). Determining objective weights in multiple criteria problems: the CRITIC method. *Computers & Operations Research,* 22(7), 763-770.

Flimm, O. (2007).The open source software OpenBib at the USB Cologne - overview and developments towards OPAC 2.0. *Research and Practice Library,* 31(2), 2-20.

Glanzel, W., & Schubert, A. (1988). Characteristic scores and scales in assessing citation impact. *Journal of Studies in International Education,* 14(2), 123-127.

Gupta, Y., Saini, A., & Saxena, A. K. (2015). A new fuzzy logic based ranking function for efficient Information Retrieval system. *Expert Systems with Applications,* 42(3), 1223-1234.

Hwang, C. L., & Yoon, K. (1981). *Multiple attribute decision making: methods and applications: a state of the art survey.* London: Springer.

Ibrihich, S., Oussous, A., Ibrihich, O., & Esghir, M. (2022). A review on recent research in information retrieval. *Procedia Computer Science,* 2022, 777-782.

Jain, S., Seeja, K. R., & Jindal, R. (2021). A fuzzy ontology framework in information retrieval using semantic query expansion. *International Journal of Information Management Data Insights,* 1(1), 100009. doi:10.1016/j.jjimei.2021.100009

Khan, M., Son, L. H., Ali, M., Chau, H. T. M., Na, N. T. N., & Smarandache, F. (2018). Systematic review of decision making algorithms in extended neutrosophic sets. *Symmetry,* 10(8), 314.

Kutlu Gündoğdu, F., & Kahraman, C. (2019). Spherical fuzzy sets and spherical fuzzy TOPSIS method. *Journal of Intelligent & Fuzzy Systems,* 36(1), 337-352.

Lewandowski, D. (2009). Ranking library materials. *Library Hi Tech,* 27(4), 584-593.

Lewandowski, D. (2010) Using search engine technology to improve library catalogs. *Advances in Librarianship,* 32, 35-54.

Liu, L., Zhou, J., An, X., Zhang, Y., & Yang, L. (2010). Using fuzzy theory and information entropy for water quality assessment in three Gorges region, China. *Expert Systems with Applications,* 37(3), 2517-2521.

Majumdar, P., & Samanta, S. K. (2014). On similarity and entropy of neutrosophic sets. *Journal of Intelligent and Fuzzy Systems,* 26 (3), 1245-1252. doi: 10.3233/IFS-130810.

Mallick, R., & Pramanik, S. (2020). Pentapartitionedneutrosophic set and its properties. *Neutrosophic Sets and Systems,* 36, 184-192.

Mercun, T., & Zumer, M. (2008). New generation of catalogues for the new generation of users: A comparison of six library catalogues. *Program: Electronic Library and Information Systems,* 42(3),243-261.

Niu, X., & Hemminger, B. M. (2010). Beyond text querying and ranking list: how people are searching through faceted catalogs in two library environments", in Proceedings of the *American Society for Information Science and Technology,* 47(1) 1-9.

Peng, X. (2019). New multiparametric similarity measure and distance measure for interval neutrosophic set with IoT industry evaluation. *IEEE Access,* 7, 28258-28280.

Peng, X., & Dai, J. (2020). A bibliometric analysis of neutrosophic set: two decades review from 1998 to 2017. *Artificial Intelligence Review,* 53(1), 199-255.

Plassmeier, K., Borst, T., Behnert, C., & Lewandowski, D. (2016). Evaluating

popularity data for relevance ranking in library information systems. In *Proceedings of the American Society for Information Science and Technology,* St. Louis.https://doi.org/10.1002/pra2.2015.1450520100125

Pramanik, S. (2020). Rough neutrosophic set: an overview. In F. Smarandache, & S. Broumi, Eds.), *Neutrosophic theories in communication, management and information technology* (pp.275-311). New York. Nova Science Publishers.

Pramanik, S. (2022a). Single-valued neutrosophic set: An overview. In: N. Rezaei (Eds) Transdisciplinarity. *Integrated Science,* vol 5(pp.563-608). Springer, Cham.

Pramanik, S. (2022b). Interval quadripartitionedneutrosophic sets. *Neutrosophic Sets and Systems,* 51, 2022, 146-156.

Pramanik, S. (In press). Interval pentapartitioned neutrosophic sets. *Neutrosophic Sets and Systems.*

Pramanik, S., Mallick, R., & Dasgupta, A. (2018). Contributions of selected Indian researchers to multi-attribute decision making in neutrosophic environment. *Neutrosophic Sets and Systems,* 20, 108-131.

Sadeh, T. (2007). Time for a change: new approaches for a new generation of library users. *New Library World,* 108(7-8),307-316.

Sahoo, S., & Panigrahi, P., (2022). Relevancy ranking assessment of a discovery tool. *Webology,* 19 (2), 3298-3309.

Sinha, S. K., & Kumar, C. (2020). Healthcare information retrieval based on neutrosophic logic. In. S. Agarwal, S. Verma, & D. P. Agrawal (Eds.), *Machine intelligence and signal processing. advances in intelligent systems and computing* (pp 225-234). Singapore: Springer Nature. doi:10.1007/978-981-15-1366-4

Smarandache, F. (1998). *A unifying field in logics, Neutrosophy: neutrosophic probability, set and logic.* Rehoboth: American Research Press.

Smarandache, F. (2019). Neutrosophic set is a generalization of intuitionistic fuzzy set, inconsistent intuitionistic fuzzy set (picture fuzzy set, ternary fuzzy set), pythagorean fuzzy set, spherical fuzzy set, and q-rung orthopair fuzzy set, while neutrosophication is a Generalization of Regret Theory, Grey System Theory, and Three-Ways Decision (revisited). *Journal of New Theory,* 29, 1-31

Smarandache, F., & Pramanik, S. (Eds). (2016). *New trends in neutrosophic theory and applications.* Brussels: Pons Editions.

Smarandache, F. & Pramanik, S. (Eds). (2018). *New trends in neutrosophic theory and applications,* Vol.2. Brussels: Pons Editions. Pp-1-459. ISSN: 978-1-59973-559-7

Wang, H., Smarandache, F., Zhang, Y.Q., & Sunderraman, R. (2010). Single valued neutrosophic sets. *Multispace and Multistructure,* 4, 410-413.

Wang, J. Q., & Zhang, Z. H. (2009). Multi-criteria decision-making method with incomplete certain information based on intuitionistic fuzzy number. *Control and Decision,* 24 , 226-230.

Wei, C., & Tang, X. (2011). An intuitionistic fuzzy group decision making approach based on entropy and similarity measures. *International Journal of Information Technology and decision Making,* 10(6), 1111-1130.

Wu, Z. B., & Chen, Y. H.(2007). The maximizing deviation method for group multiple attribute decision making under linguistic environment. *Fuzzy Sets and Systems,* 158, 1608-1617.

Xu, Z., & Hui, H. (2009). Entropy based procedures for intuitionistic fuzzy multiple attribute decision making. *Journal of System Engineering and Electronics,* 20(5), 1001-1011.

Ye, J. (2014). A multi-criteria decision-making method using aggregation operators for simplified neutrosophic sets. *Journal of Intelligent and Fuzzy Systems,* 26, 2459-2466.

Zadeh, L.A. (1965). Fuzzy sets. *Information and Control,* 8(3), 338-353.

Yager, R. R. (2013, June). Pythagorean fuzzy subsets. In *2013 joint IFSA world congress and NAFIPS annual meeting (IFSA/NAFIPS)* (pp. 57-61). IEEE.

Yager, R.R. (2017). Generalized orthopair fuzzy sets. *IEEE Transactions on Fuzzy Systems,* 25 (5), 1222-1230.

Zhang, J. Y., & Wang, L. C. (2015). Assessment of water resource security in Chongqing City of China: what has been done and what remains to be done? *Natural Hazards,* 75, 2751-2772.

Zou, Z. H., Yi, Y., & Sun, J. N. (2006). Entropy method for determination of weight of evaluating indicators in fuzzy synthetic evaluation for water quality assessment. *Journal of Environmental Sciences,* 18(5), 1020-1023.

Use and Awareness of N-LIST E-Resources by the Faculty and Students of Vivekananda Mahavidyalaya, Haripal, Hooghly

Dr. Animesh Bhattacharyya

Librarian, Vivekananda Mahavidyalaya, Hooghly

Dr. Sourav Chatterjee

Librarian, Syamaprasad College, Kolkata

Abstract

National Library and Information Services Infrastructure for Scholarly Content (N-LIST) is a project offered by the INFLIBNET centre to colleges and other higher education institutions to provide e-resources to students, researchers, scholars and faculty members. The present study highlights the use and awareness of the said programme among the users of Vivekananda Mahavidyalaya, Haripal, Hooghly. The objectives of this study are to understand the usage, purpose, frequency of access and other issues related to the N-LIST programme. The study was based on a survey of faculty members and students through a web-based questionnaire but the study is limited only to a college under the University of Burdwan. The result shows that most of the respondents were aware of the N-LIST programme and used the materials available in the N-LIST for research and preparation of projects. It is also found that respondents were satisfied with the facilities of the N-LIST programme. This study helps library and information professionals of different colleges to understand the utility of the N-LIST programme and the necessity of library orientation and awareness programmes regarding the use of e-resources.

Keywords: College library, Consortium, E-Journal, E-Resources, E-ShodhSindhu, INFLIBNET, N-LIST

1. Introduction

In the present digital environment e-resources are vital to satisfy academic information needs. The concept of e-resources changes the nature and information seeking behaviour of faculty members, research scholars and students. At the same time different websites and digital media provide huge information through the internet. But a large number of that information is not coming from authentic sources such as journals, e-books and databases. The cost of accessing these authentic and reputed journals and databases is very high. In this situation, academic libraries have been facing challenges to provide authentic e-resources to their users within their limited budget. Library consortia is the only solution by sharing the resources among the member institutions. In India the higher education system is facing a phase of tremendous growth in information and knowledge field (Narayanaswami, 2016). In this situation UGC has been providing N-LIST project to the affiliated colleges and higher educational institutions. The e-ShodhSindhu Consortium of the INFLIBNET Centre and the INDEST-AICTE Consortium

of IIT Delhi are working together to carry out the project "National Library and Information Services Infrastructure for Scholarly Content" (N-LIST). Previously this programme was funded by the MHRD under NME-ICT. The project was initiated during from 2010-2013 to extend access to electronic resources to colleges under 12B of UGC act and other Non-aided colleges. In 2014, N-LIST programme has subsumed under e-ShodhSindhu consortium as college component and it is being funded by UGC. It offers access to certain digital resources for institutions as well as cross-subscription to e-resources that the aforementioned two consortia have subscribed to (N-LIST, 2023, about N-LIST). The key features of the N-LIST are to access e-resources and download facilities of e-contents by authorised users directly from the publishers' website.

2. Review of the literature

A massive growth in e-resources has given us the gift of e-learning, or the intentional use of networked communication and information technologies for teaching and learning (Das Biswas & Biswas, 2012). In this regard, N-LIST project is one of the pioneering projects of INFLIBNET. Many significant studies on N-LIST have been carried out by different authors. Narayanswamy (2016) discussed the need for orientation and awareness programmes for effective use of N-LIST e-resources. George, Pillai and Apama (2015) tried to understand the usage patterns, and preference level of satisfaction of N-LIST programme and they also studied the need for orientation programme and different suggestions from the users. Kumar (2013) briefly discussed in his paper the components and e-resources available through N-LIST and process of access and awareness about this programme among the colleges in India. Solanki (2016) studied the college libraries at Saurashtra University to understand the awareness and use of e-resources offered by N-LIST programme among library users. This study also highlighted the need for awareness programmes and seminars for the optimum use of N-LIST programme. Chandra (2011) discussed the scope and coverage of N-LIST programme, its components and status of usage in the academic environment. Kumar (2018) found that majority of the faculty and students accessed e-resources through N-LIST and this consortium has helped the libraries to enrich their collection development of e-resources. The usage and efficacy of the N-LIST programme of senior college libraries in Kolapur city were investigated by Bansode and Burungale (2019). This study was based on responses of faculty members and finally found out the majority of faculty members used N-LIST for their research and development. Ramesh and Rajendra (2018) examined the current status of N-LIST among the research scholars and described the functions, availability of e-resources, advantages and disadvantages of N-LIST programme.

Therefore it is clear from the above previous study that different academicians and scholars studied the awareness and usages of N-LIST programme among the faculty members and students. Those studies were mostly based on different states and universities in India, but no particular study sharply indicates the present condition of academic institutions in West Bengal regarding usage and awareness of N-LIST consortia. It is important to understand the usage status of N-LIST programme among general undergraduate students and faculty members. Present study highlights the awareness and usage of N-LIST e-resources and the role of library to provide this service in Vivekananda Mahavidyalaya under the University of Burdwan in Hooghly district.

3. Objectives of the study

The major objectives of the study are:

- to understand the awareness of N-LIST e-resources among the students and faculty members of the Vivekananda Mahavidyalaya
- to understand the usages of N-LIST programme by the members
- to assess how frequently the N-LIST resources are accessed
- to examine the purpose and utilisation of e-resources available in N-LIST programme
- to understand the relevancy of resources to our user community
- to understand the problem in using N-LIST e-resources.

4. Scope and coverage

The study was conducted among the teachers and students of Vivenkananda Mahavidyalaya, Haripal, Hooghly under the University of Burdwan. The college has an N-LIST membership since 2012. All faculty members and students of different semesters are enjoying the access facilities of N-LIST e-resources through individual ID and password from their homes and College central library.

5. Methodology

A questionnaire and interview methods were used for collecting the data. A Google form was created and distributed among the faculty members and students for collecting data as well as data taken from N-LIST websites also. After collecting data, it was organised and analysed to fulfill the objective of the study. For this purpose, simple arithmetic techniques and statistical methods were used. MS-Word and MS-Excel were utilised for analysis and interpretation of the data. APA citation style was followed for references and citations.

6. Data analysis

On the basis of the objectives of the study collected data has been organised in a structured tabular form as well as charts and diagrams to describe the status of awareness of faculty members and students of Vivekananda Mahavidyalaya, Haripal about N-LIST programme.

Table 1: Gender distribution of respondents

Sex	No. of respondents	Percentage (%)
Male	63	52.5
Female	57	47.5
Total	**120**	**100**

Table 1, shows that out of 120 respondents 63 were male and 57 were female respondents. Therefore 52.5% of respondents were male and 47.5% of rest participants were female respondents.

Table 2: Age wise distribution of respondents

Age	No. of respondents	Percentage (%)
Below 25	41	34.3
25-35	21	17.5
35-45	34	28.3
45-55	20	16.7
Above 55	4	3.3
Total	**120**	**100 %**

Table 2 represents that 41 respondents belong to the age group below 25 years. 21 respondents were in the age group of 25-35 years; 34 (28.3%) respondents were between the age of 35 and 45. There were 20 participants in the 45 to 55 year age range, while just 4 people were over the age of 55.

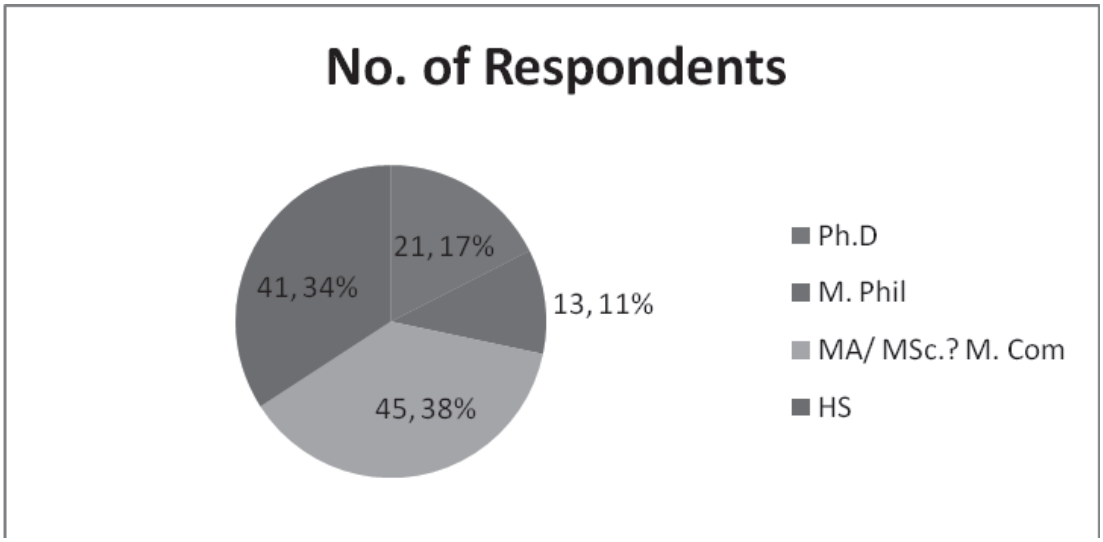

Figure 1: Distribution of respondents according to their highest qualification

According to figure 1 most of the respondents (45, 38%) have master's degree and 13 respondents have M. Phil degrees and 21 respondents have Ph. D. degrees. Further 41 respondents passed Higher Secondary (HS) level.

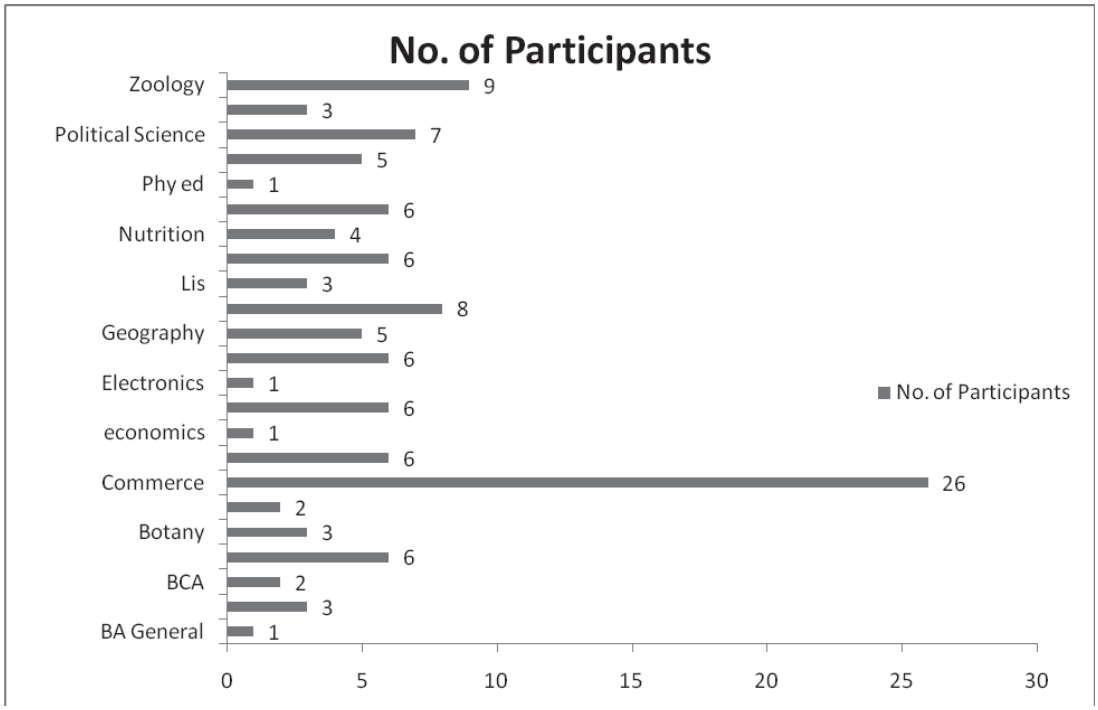

Figure 2: Subject wise distribution of respondents

In figure 2, subject wise distribution of respondents has been shown. It shows that most of the respondents are in the discipline of commerce. A few subjects have only 1 respondent and the rest of the population has covered almost all disciplines taught in the college.

Table 3: Designation wise distribution of respondents

Designation	No. of Respondents	Percentage (%)
Associate Professor	9	7
Assistant Professors	30	25
Library professionals	2	2
SACT	38	32
Students	41	34
	120	100 %

Table 3 shows that out of 120 total respondents, 7 are Associate Professors, 30 respondents were represents Assistant professors. State Aided College Teachers (SACT) are 38 persons and rest 41 respondents are college students of different semesters.

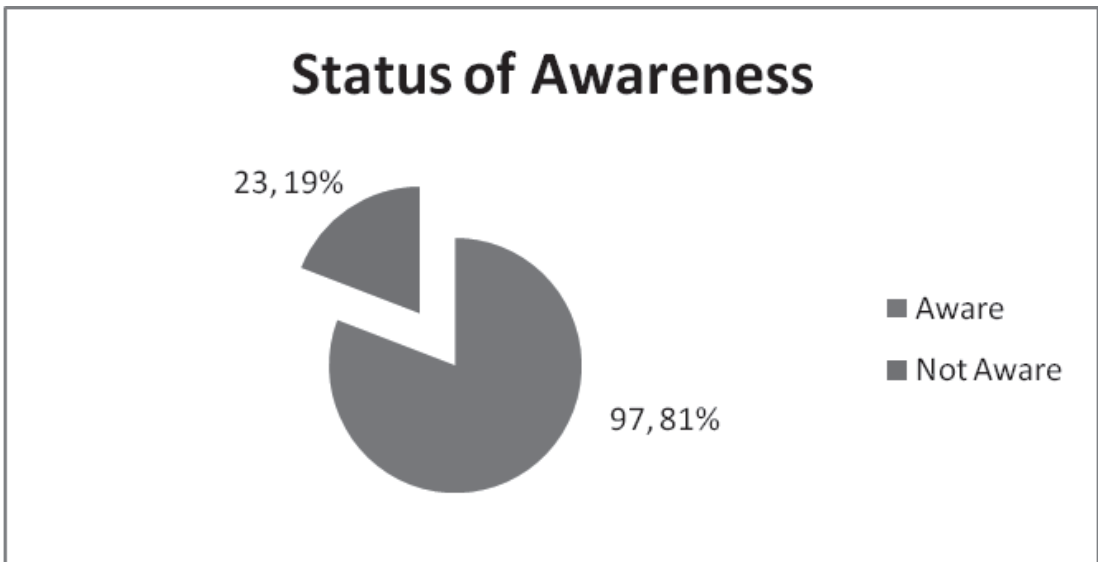

Figure 3: Status of awareness of N-LIST programme among the users

It is clear from the above (Fig. 3) that 97 (80.8 %) respondents are aware of the N-LIST programme and rest of the respondents23 (19.2%) are not aware of the e-resource services.

Table 4: Source of information about N-LIST programme

Source of information	No of respondents	Percentage (%)
College Library	93	84.5
Institutional Website	10	9.1
Conference / Seminar	15	13.6
Social media	12	10.9
Friends/ Colleagues	23	20.9

Table 4 shows the source of information from which users become aware about N-LIST programme. It is clear from the table that 93 (84.5%) respondents awarded from college library regarding N-LIST and 10(9.1%) users have been informed about the said programme from institutional or college website.

Table 5: Distribution of respondents according to nature of use of e-journals

E-Journals	No. of users	Percentage (%)
American Institute of Physics(18 titles)	14	16.3
Annual Reviews(33 titles)	14	16.3
Cambridge University Press(224 titles)	15	17.4
Economic and Political Weekly(1 titles)	19	22.1
Indian Journals (180+ titles)	51	59.3
Institute of Physics(46 titles)	7	8.1
JSTOR(2500+ titles)	38	44.2
Royal Society of Chemistry (29 titles)	7	8.1
Oxford University Press(206 titles)	20	23.3
H W Wilson(3000+ titles)	7	8.1

Table 5 shows that most of the users used Indian journals and JSTOR followed by journals of Oxford university press and EPW. Less used journals are of Institute of Physics and H W Wilson.

Table 6: Distribution of respondents according to use status of E-books

E-Books	No. Of Users	Percentage (%)
Cambridge Books Online	26	33.8
E-brary (125000+ titles)	35	45.5
EBSCoHostNet Library (936 titles)	12	15.6
Hindustan Book Agency (65+ titles)	18	23.4
Institute of South East Asian Studies(ISEAS) Books (382+ titles)	11	14.3
Oxford Scholarship (1402+ titles)	17	22.1
Springer eBooks (2300 titles)	33	42.9
Sage Publication eBooks (1000 titles)	24	31.2
Taylor Francis eBooks (1800 titles)	17	22.1
My library McGraw Hill (1124 titles)	17	22.1

In the table 6, it is clear that most of the respondents used E-brary for e-books, followed by Springer e-books, Cambridge books online, sage publication, Taylor Francis e-books etc. books under Institute of South East Asian studies are less used by the respondents.

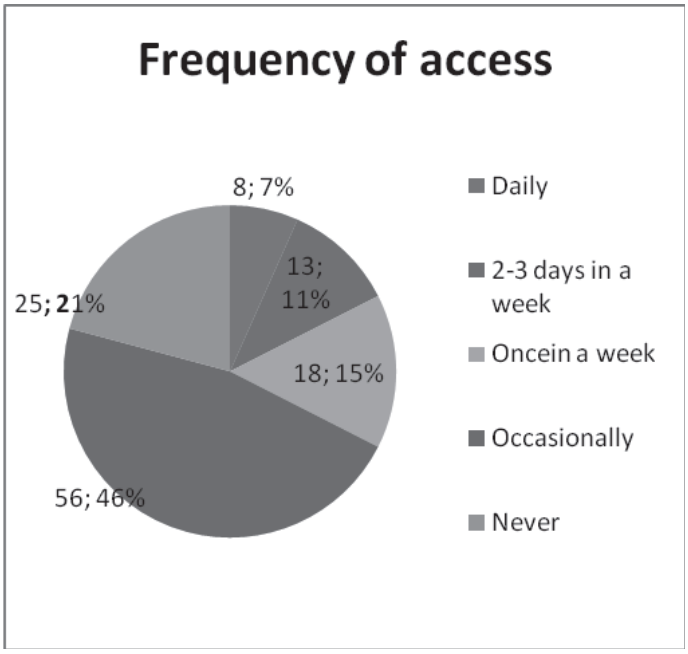

Figure 4: Frequency of access N-LIST e-resources by the respondents

Figure 4 represents the frequency of access to N-LIST programme. It is clear from the above figure that, 46% of respondents used the programme occasionally and 21% of respondents have never used N-LIST programme.

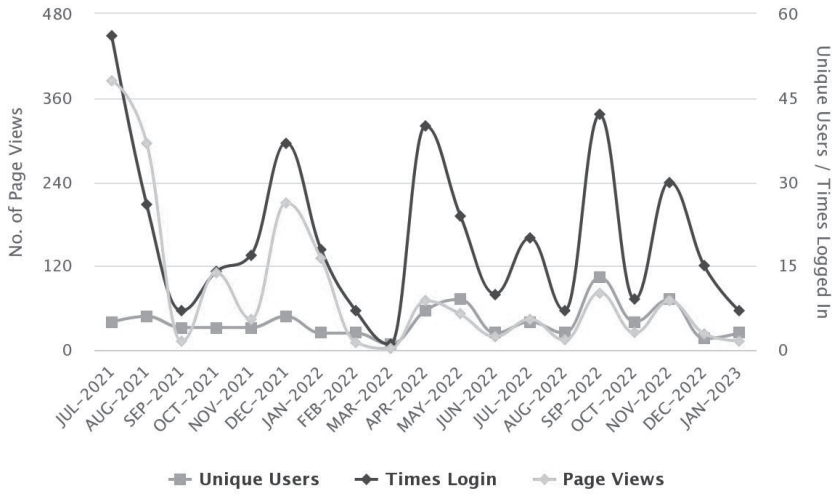

Figure 5: Screenshot of users activity on N-LIST programme

Figure 5 expresses the users' activity on the N-LIST programme during the period from July 2021 to January 2023. This screenshot from the N-LIST website represents the N-LIST use statistics about the unique users, the number of times they login to the programme and the number of pages viewed by the users during the period.

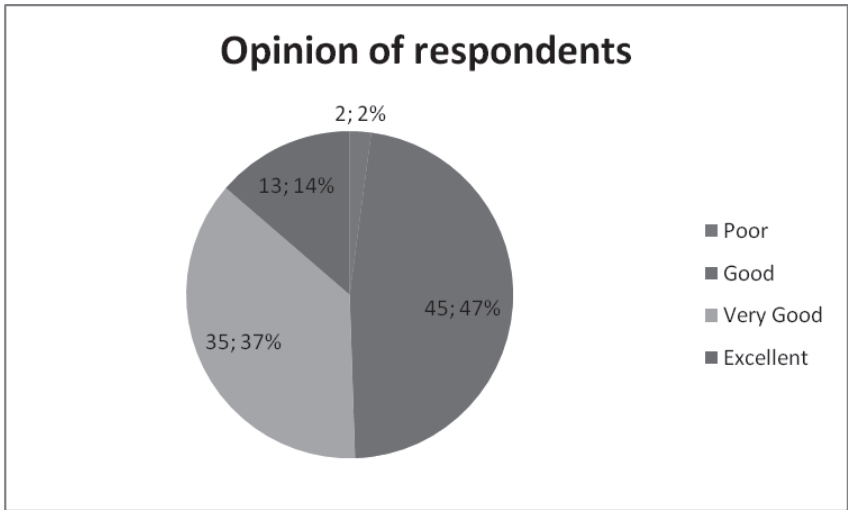

Figure 6: Opinion of respondents regarding N-LIST programme

Figure 6 shows that most of the respondents expressed their opinion about N-LIST. Most of the respondents said that the service of N-LIST is good on the other hand only 2% of users felt it is poor.

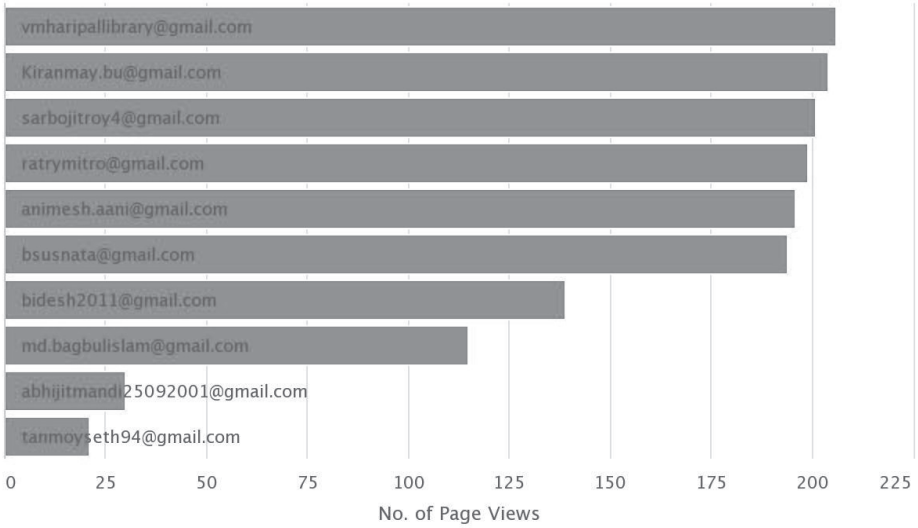

Figure 7: Screenshot of top 10 users

A screenshot of the top ten users from the N-LIST website is shown in figure 7. It shows that the top three users viewed more than 200 pages and five users viewed more than 100 pages during the period. Only two users viewed less than 50 pages during the period.

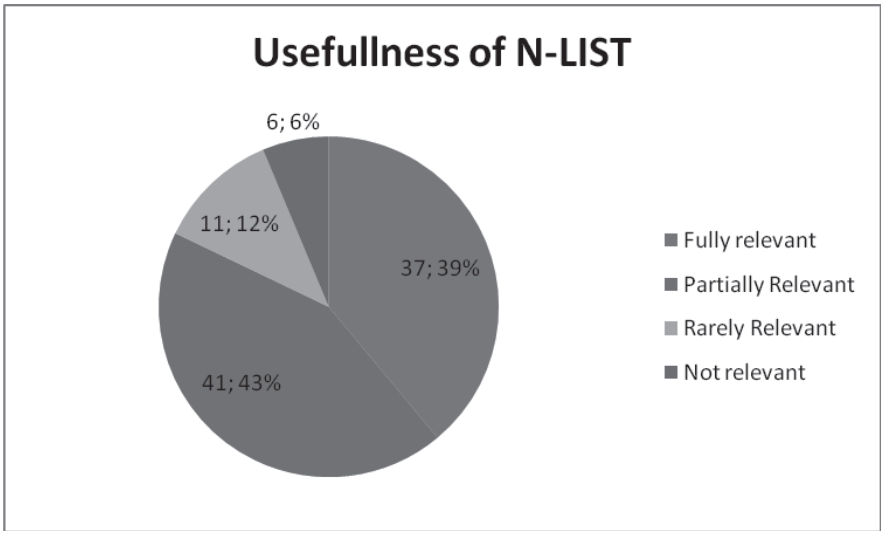

Figure 8: Usefulness of contents available in N-LIST

In figure 8, the usefulness of contents of N-LIST has been analysed. It is clear from the diagram that, most of the respondents agreed that the contents are partially relevant to the course and 6% expressed the contents are not relevant.

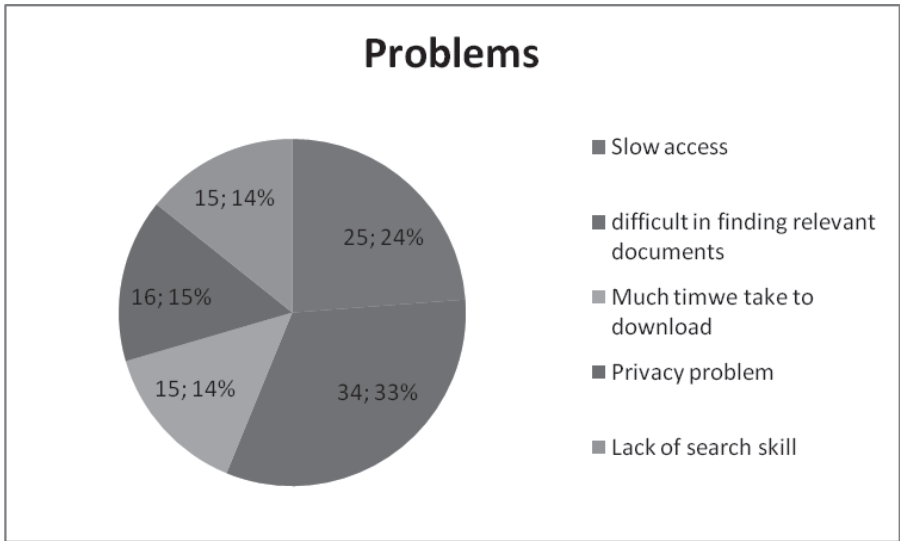

Figure 9: Problems of accessing N-LIST

Users of N-LIST also faced several problems to access the e-resources under this programme. This (Figure 9) diagram shows that 33% of respondents faced the problems of finding relevant documents, 24% of users lacked search skills, 15% of respondents faced privacy problems and 14% of respondents said that it is very slow and much time take to download.

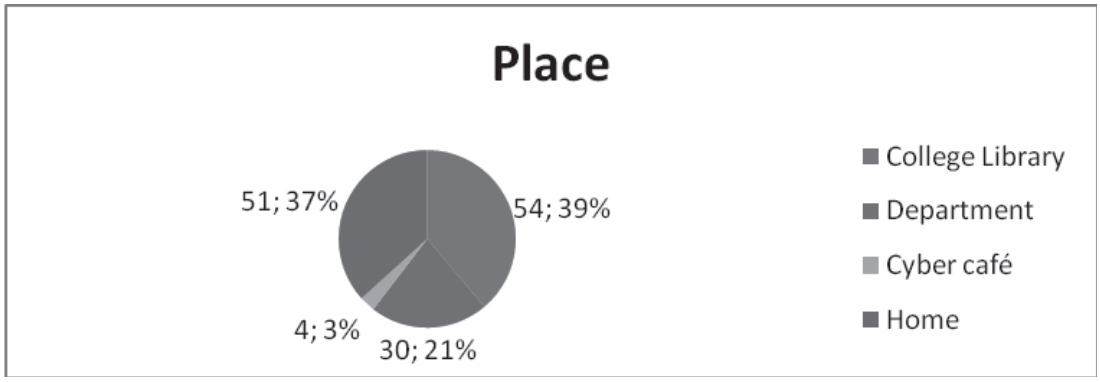

Figure 10: distribution of respondents according to place of access

According to figure 10, 39% of respondents accessed the N-LIST programme from college library using personal laptop or college infrastructure and 37 % of respondents used it from home. 21% of respondents used from departmant and only 3% went to cybercafe for using N-LIST programme.

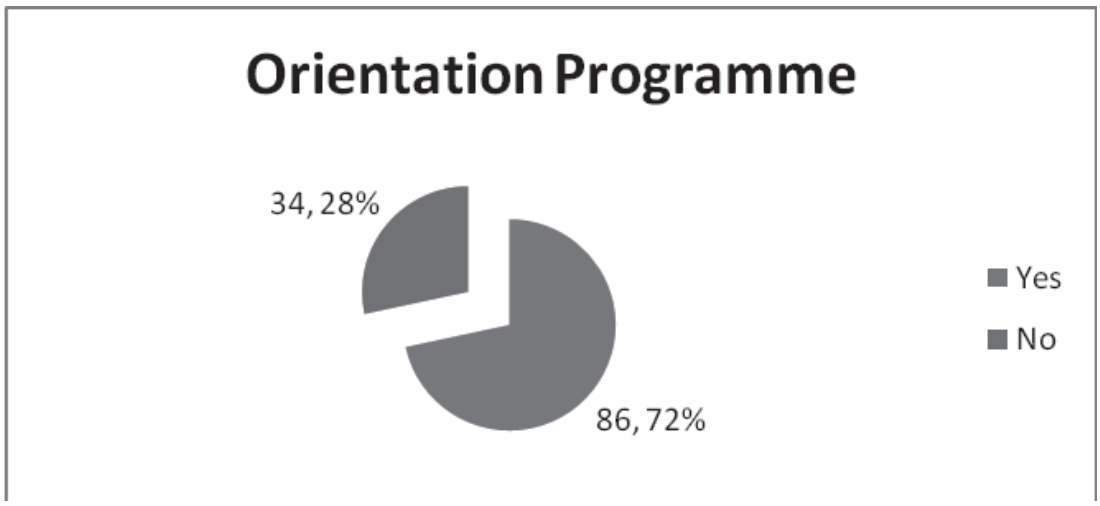

Figure 11: Attendance of Orientation Programme

Figure 11 shows that 86 (72%) respondents have attended OP (Orientation Programme) on N-LIST programme and 34 (28 %) respondents did not attend the OP about the said programme.

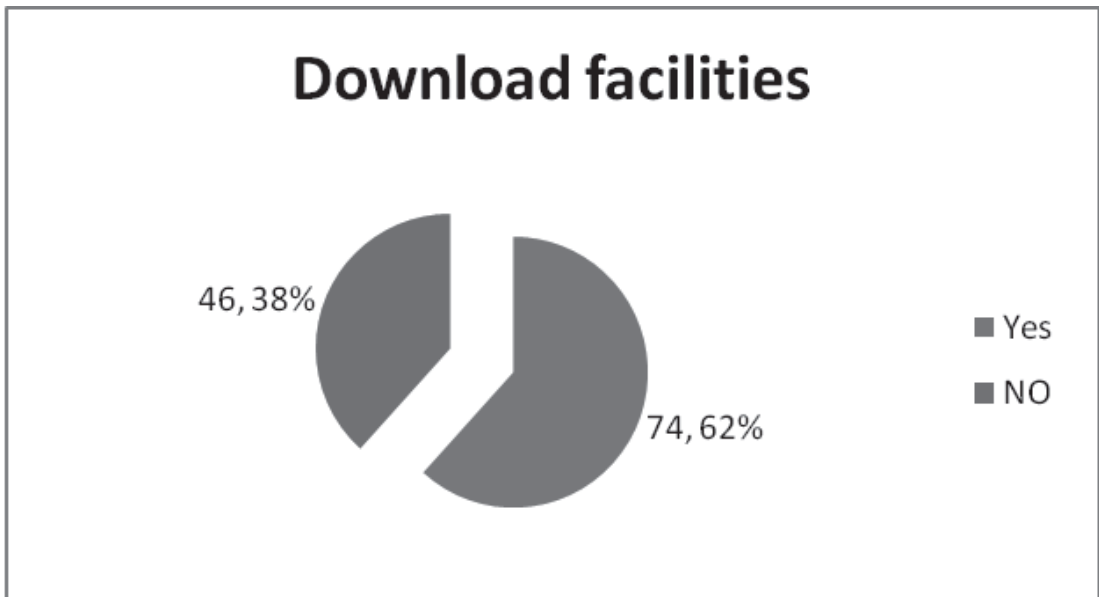

Figure 12: Status of download facilities among the users

Figure 12 shows that 62% of respondents used download facilities form N-LIST programme and only 38% of respondents never used download facilities.

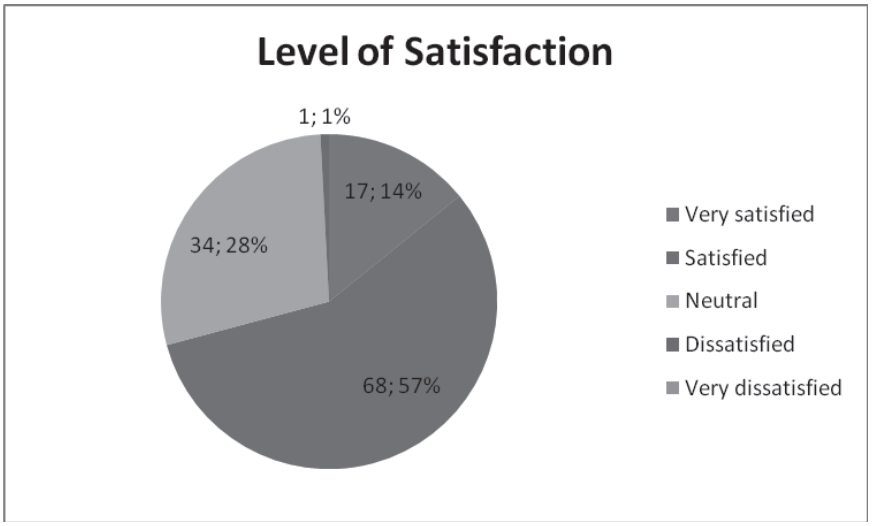

Figure 13: Satisfaction level of N-LIST users

The level of satisfaction of N-LIST project is shown in figure 13. It is clear from the diagram that most of the respondents are satisfied with N-LIST programme.14% of respondents are very satisfied and 57% are satisfied. 28% of respondents said they are neutral about their opinion regarding the N-LIST programme. Only 1% of respondents are dissatisfied about the programme. Over all opinion about N-LIST project is good.

7. Findings

- Most of the respondents are male and belong to the age group below 25 years and a maximum of them have Masters's degree followed by H.S. level and M.Phil. and Ph. D respectively.
- A large portion of respondents are students followed by SACT, Assistant Professor and Associate Professor and Librarians and they are aware of N-LIST programme and they have become aware from college library.
- It is clear from the study that most of the respondents used N-LIST occasionally and more than 205 respondents never used N-LIST programme. However, most of the respondents expressed that their opinion of N-LIST is good, very good and excellent. Moreover, a large number of participants' opinions regarding the usefulness of N-LIST contents are partially or fully relevant to the course.
- This study highlights that a large number of N-LIST users faced different problems while they are using N-LIST. These are mainly difficult in finding relevant topics, privacy problems and slow download speed.
- It shows that most of the respondents access N-LIST from the college library and home. Further, it is clear from the study that out of 120 respondents 71.7 % respondents have attended the Orientation Programme conducted by the library. Among the respondents, 61.7% of respondents used download facilities from N-LIST programme.

8. Conclusion

N-LIST is a programme offered by the INFLIBNET centre to colleges and other higher education institutions to provide e-resources to students, researcher scholars and faculty members. This study tries to highlight the usefulness and awareness of N-LIST programme among college students and faculty members. This study shows that most of the respondents are using the services and they are satisfied with the services but some of them expressed that it is useful but partially relevant with the courses. It is also noted that the above study is limited to a college under the University of Burdwan. Further study should be required on the basis of a larger sample covered with other colleges. Library awareness programme is important for the better and wider use of N-LIST programme. It will help the users to access e-resources for better academic achievement.

References

Chandra, J. (2011). N-LIST: e-journal consortium for college libraries. Conference: *AICTE Sponsored National Seminar on Efficient Use of Electronic Resources: Present and Future.* At: Narula Institute of Technology, Kolkata.DOI: 10.13140/RG.2.1.4241.7126

Das Biswas, M., & Biswas, A. (2012). Digital rights management in e-learning: challenges facing higher education institutions. *Calcutta University Journal of Information Studies (CUJIS),* 14 (02), 65 -71. Retrieved

from https://www.researchgate.net/publication/352477179_Digital_rights_management_in_e-learning_challenges_facing_higher_education_institutions

George, A.; Pillai, M.G., & Apama, P. R. (2015). Use of N-LIST programme and the role of college librarians: a survey. In *International Conference of Building Knowledge Centres, NMAM Institute of Technology,* Udupi, 1-2, January, 2015. Retrieved from http://eprints.rclis.org/24825/1/AnnuGeorge_IEEEr.pdf

Kumar, P. R. S., Venkateswar, Y. CH., & B. R. D. (2018). Use of N-LIST e-resources by faculty and students of MRITS and MRCE engineering college libraries, Hyderabad, Telangana- a case study. *Journal of Advances in Library and Information Science,* 7(4), 304-308. Retrieved from http://jalis.in/pdf/7-4/Raja.pdf

Kumar, R. G. (2013). Awareness and use of electronic resources through N-LIST: a boon to academic libraries. *International Journal of Librarianship and Administration,* 4(1), 17-25. Retrieved from http://www.irphouse.com/ijla/ijlav4n1_03.pdf

Nagu N. B., & Navanath V. B. (2019|). Usages and effectiveness of INFLIBNET N-LIST programme: a study. *Journal of Advancements in Library Sciences,* 6 (Special Issue 1), 272-278. Retrieved from https://www.researchgate.net/publication/332697143_Usages_and_Effectiveness_of_INFLIBNET_N-LIST_Programme_A_Study

Narayanswamy, B. V. (2016). Use and awareness of N-LIST services by degree colleges in Bangalore: a study. *International Research Journal of Multidisciplinary Science & Technology,* 1(5), 63-68. Retrieved from https://core.ac.uk/download/pdf/72805325.pdf

N-LIST (2023). Retrieved from https://nlist.inflibnet.ac.in/vabout.php

Solanki, M.R. (2016). Awareness and use of N-LIST programme in college libraries affiliated to Saurashtra University. *Journal of Research in Humanities and Soc Sciences,* 4(5), 35-44. Retrieved from www.raijmr.com/ijrhs/wp-content/uploads/2017/11/IJRHS_2016_vol04_issue_05_07.pdf

COLLEGE LIBRARIES

(A Peer Reviewed Quarterly Journal) ISSN : 0972-1975

SUBSCRIPTION RATE : (Rs.)				
CATEGORY	**1 YEAR**	**2YEARS**	**3YEARS**	**5 YEARS**
Association Life Member	Free	Free	Free	Free
Individual	1000	1800	2700	4000
Institutional / Corporate Member	1000	2000	2800	4500

Postal charges will be borne by the subscriber

Rate: For West Bengal- 50/= per issue

For other States -100/= per issue

Subscription amount may be remitted by Cheque/Demand Draft in favour of

"WEST BENGAL COLLEGE LIBRARIANS' ASSOCIATION"

Payable at Kolkata.

For on line payment, the account details are as follows -

Name of the Bank : Punjab National Bank

Name of Branch : Kolkata Garpar

Name of the Beneficiary : West Bengal College Librarians' Association

Account No. : 1963000101231782

Account Type : Saving

IFSC : PUNB0196300

MICR : 700024050

How Can You Help Us

1. Acting as a referee for the journal.
2. Recruiting few peers for the various editorial activities.
3. Writing articles/book reviews for the journal.
4. Encouraging others to contribute articles for the journal.
5. Subscribing our journals for your personal or institutional use.
6. Suggesting improvement of the journals and many more...

College Libraries Vol. 38 No. I March 2023

CONTRIBUTORY PRICE Rs. 250/-

R E M E M B E R

*** ASSOCIATION COUNTS NOT THE INDIVIDUAL**

*** DEDICATED SERVICE IS A MUST FOR ALL LIBRARIANS**

*** SPIRIT OF SERVICES MUST PLAY THE FOREMOST ROLE**

Published by Dr. Sanat Kumar Biswas, General Secretary,
West Bengal College Librarians' Association (WBCLA) and
printed by "Moodran Graphica",
41, Gokul Boral Street Kolkata - 700 012