

# **An Analytical Study on the Utilization and Challenges of ICT Infrastructure in College Libraries of Haridwar District**

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## **Abstract**

*The integration of Information and Communication Technologies (ICTs) in academic libraries has revolutionized the way information is accessed, managed, and disseminated. This study investigates the extent and effectiveness of ICT usage among users of various university libraries in the Haridwar district of Uttarakhand, India. Using a mixed-method approach comprising surveys and interviews, the study explores user familiarity with ICT tools, frequency of usage, available digital infrastructure, and challenges faced by both users and library staff. The findings reveal that while there is a moderate level of ICT integration, significant disparities exist in user access, training, and technical support. Factors such as digital literacy, institutional funding, and administrative support play crucial roles in shaping ICT usage. The study concludes by recommending strategic interventions for enhancing ICT-based services in university libraries to foster academic excellence and equitable access to knowledge resources.*

**Keywords:** *ICTs, university libraries, Haridwar district, digital literacy, academic infrastructure, library users, information access, e-resources, educational technology, library modernization*

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## **I. Introduction**

Libraries are primarily storehouses of information resources for the development of human intellectual capacity. The library has the primary role of acquiring, processing, organizing, preserving as well as conserving the printed and non-printed information resources or materials for the use of their clientele (Martins, 2011). Academic libraries are majorly libraries established in academic institutions such as universities and polytechnics to supply the information resources required for teaching, learning, and research. In academic institutions today, the invention and evolution of both the internet and the technological devices that allow us to access the internet (and access each other through the internet) have revolutionized the way a person can research, learn, and spread new ideas.

In the rapidly evolving landscape of information technology, the role of Information and Communication Technologies (ICTs) in academic libraries has become indispensable. ICTs have transformed traditional university libraries into dynamic learning and research centers, enabling users to access a wide spectrum of digital resources with speed and efficiency. The effective integration of ICTs in library services enhances user satisfaction, broadens accessibility to information, and promotes academic excellence.

In the context of Indian higher education, particularly in semi-urban and religiously significant areas like Haridwar, the role of ICTs in university libraries is both an opportunity and a challenge. Despite being home to several reputed universities, the degree of ICT adoption and the users' proficiency in utilizing these technologies can vary significantly. Hence, an analytical study of the use of ICTs by university library users in Haridwar district becomes essential to understand existing practices, highlight gaps, and recommend improvements.

## **About the Study Area**

Haridwar, located in the state of Uttarakhand, is not only one of the seven holiest places in Hinduism but also a growing educational hub. The district hosts several higher education institutions including Gurukul Kangri University, Dev Sanskriti Vishwavidyalaya, Uttarakhand Sanskrit University, and other affiliated colleges and private universities. These institutions cater to a diverse student population, with varying degrees of exposure to ICTs. The unique blend of traditional and modern education systems makes Haridwar an ideal location to study the impact and usage of ICTs in university libraries.

### Research need

For academic libraries to effectively carry out their tasks in this 21st century librarians must adopt emerging technologies. The size of libraries or their collections may not be the benchmark but rather accessibility to the major thrust of the library automation. For any library to derive maximum benefit in this information age, it has to be online.

Application of ICT in libraries enhances users' satisfaction. It provides numerous benefits to library users. Some of the benefits of the application are:

1. Provide speedy and easy access to information
2. Provides remote access to users
3. Provides round the clock access to users
4. Provides access to unlimited information from different sources
5. Provides information flexibility to be used by any individual according to his/her requirements
6. Provides increased flexibility
7. Facilitates the reformatting and combining of data from different sources.

**Significance of the Study:** This study is significant in multiple dimensions:

- By evaluating how effectively ICTs are being utilized in university libraries, the study can help in identifying technological gaps and infrastructural needs.
- Understanding the user's ability to interact with ICT tools can aid in designing targeted training programs to improve digital literacy among students and faculty.
- The findings of this study can be used by university administrators and policymakers to upgrade library services and align them with national digital education initiatives.
- The research will contribute to the academic discourse on ICT use in libraries, particularly in the context of tier-2 cities and religious-educational centers like Haridwar.

### Need for the Study

Despite the growing emphasis on digitization, many university libraries in India, especially in smaller cities, still face challenges such as lack of adequate infrastructure, insufficient staff training, and low digital awareness among users. There is a pressing need to:

- Assess the actual level of ICT integration in university libraries of Haridwar.
- Identify the patterns, preferences, and problems faced by users in accessing ICT-based services.
- Explore whether ICT tools are being used optimally for academic and research purposes.
- Recommend strategic interventions for improving ICT accessibility and utility in libraries.

The study is therefore crucial in bridging the gap between technological availability and actual user engagement in university libraries within the Haridwar district.

### Objectives of the Study

The general objective of this study was to survey librarians' attitudes towards ICTs in selected college libraries in Haridwar district. The specific objectives of this study are:

1. To find out librarians qualification to use ICTs
2. To examine the frequency of ICT use by librarians according to their service period.
3. To investigate the age librarians in the library to adapt the ICTs.
4. To examine the ICTs availability in the colleges

## II. Research methodology

Descriptive survey design was used for the study. The population for the study comprised professional and para-professional librarians in all government, semi-government, private and added college libraries in Haridwar region. The questionnaire was used as the instrument for collecting data. In analyzing the data collected from the field, the descriptive statistics specifically tables and percentages were used. All these were done using the Statistical Package for Social Sciences (SPSS).

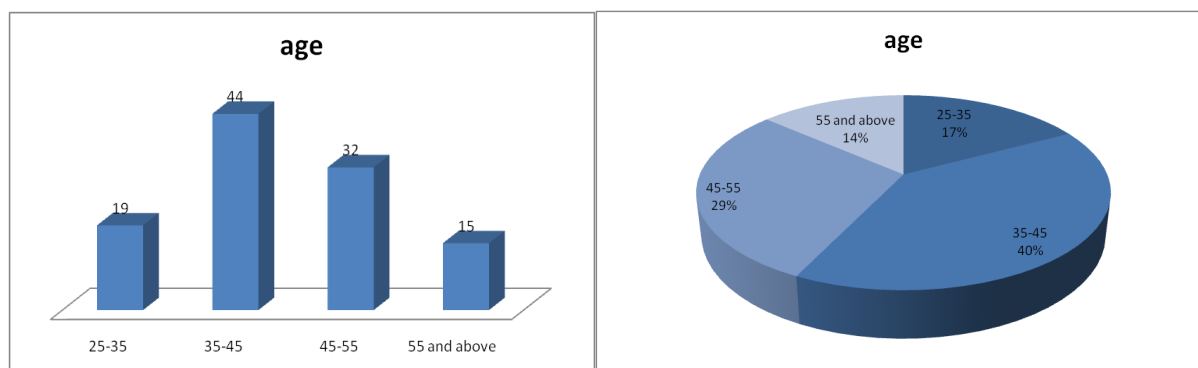
### Observation and data analysis

According to the survey based on the questionnaire the following tables and graphs were drawn as demographic analysis.

**Table 1:** Demographic Analysis Of The Respondents of Haridwar District

S no.	Age	Frequency	Percentage
1	25-35	19	17.2
2	35-45	44	40

3	45-55	32	29.2
4	55 and above	15	13.6
	TOTAL	110	100

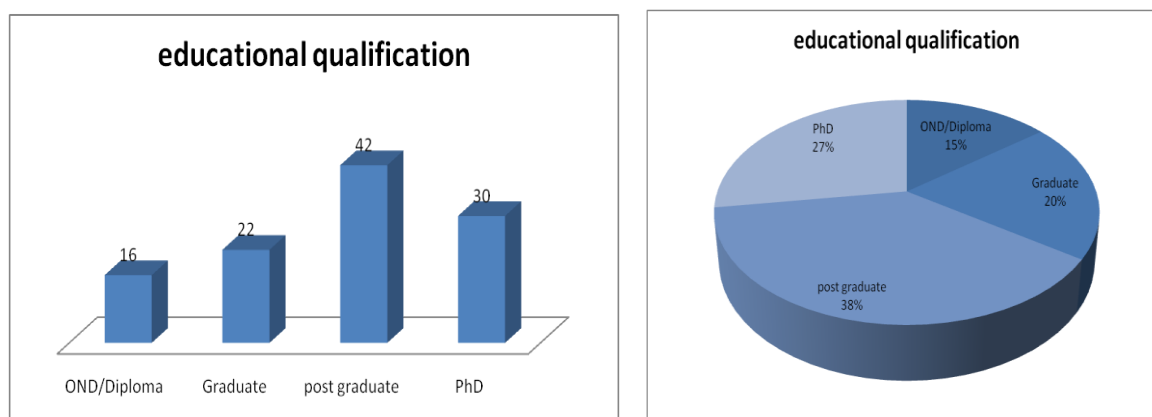


Graph 1: Analysis Of The Respondents of Haridwar District

Out of 110 respondents, 19 representing 17.2% were between 25-34 years old, 44 representing 40.0% were between 35 – 44, 32 representing 29.2% were between 45 -54, and the least which is 15 were 55 and above.

Table 2: Educational qualification Of The Respondents of Haridwar District

S no.	Educational qualification	Frequency	Percentage
1	OND/Diploma	16	14.5
2	Graduate	22	20
3	post graduate	42	38.2
4	PhD	30	27.3
	TOTAL	110	100



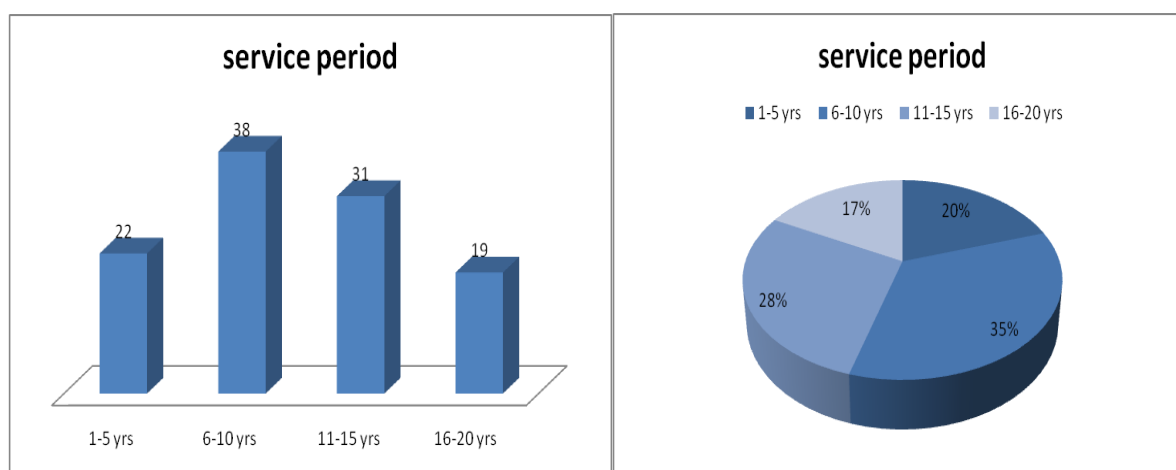
Graph 2: Analysis Of Educational qualification of The Respondents of Haridwar District

Table 2 presents the educational qualifications of the respondents surveyed from various university libraries in Haridwar district. Out of a total of 110 respondents, the majority—42 individuals (38.2%)—were postgraduates, indicating a strong representation of academically advanced users who likely have higher exposure to and need for ICT services in libraries. This is followed by 30 respondents (27.3%) holding PhD degrees, suggesting a significant proportion of research scholars and faculty members among the users. Graduates accounted for 22 respondents (20%), while those with OND/Diploma qualifications constituted the smallest group, with 16 individuals (14.5%). The data reveals that more than 65% of the users possess postgraduate or higher degrees, emphasizing the importance of providing advanced digital resources and ICT tools in university libraries to meet the academic and research demands of these users. The relatively smaller percentage of diploma holders also reflects the academic orientation of university library users in Haridwar, where the user base primarily comprises individuals engaged in higher education and scholarly work.

Table 3: Service period of librarians Of The Respondents of Haridwar District

S no.	Service period	Frequency	Percentage
1	1-5 yrs	22	20
2	6-10 yrs	38	34.5
3	11-15 yrs	31	28.2
4	16-20 yrs	19	17.3
	TOTAL	110	100

Table 3 outlines the service period of librarians working in various university libraries across Haridwar district. Among the 110 respondents, the largest group—38 librarians (34.5%)—have a service period ranging from 6 to 10 years. This indicates that a substantial portion of the library workforce is relatively experienced and has likely witnessed the gradual integration of ICTs into library services.



Graph 3: Analysis of Service period of librarians Of The Respondents of Haridwar District

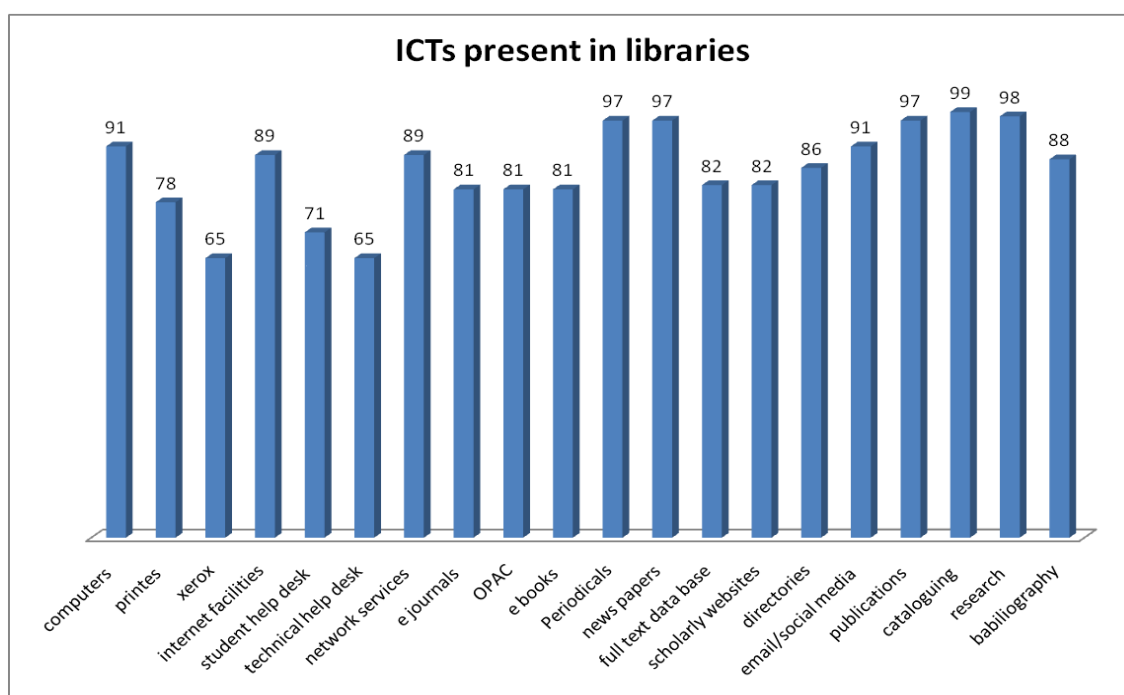
The next significant group comprises 31 librarians (28.2%) who have been in service for 11 to 15 years, suggesting a solid foundation of mid-career professionals who may possess both traditional and modern library management skills. 22 librarians (20%) have served between 1 to 5 years, reflecting the presence of newer professionals who might be more familiar with current technological trends. Meanwhile, 19 respondents (17.3%) have served between 16 to 20 years, representing the most experienced group, likely with a deep understanding of the evolution of library services over time. The distribution suggests a balanced mix of early-career, mid-career, and senior professionals, which is crucial for fostering both continuity and innovation in library practices, especially in the context of ICT adoption and digital transformation.

Table 4: ICTs present in libraries of Haridwar District

s no	ICTs present in libraries	frequency
1	computers	91
2	printes	78
3	xerox	65
4	internet facilities	89
5	student help desk	71
6	technical help desk	65
7	network services	89
8	e journals	81
9	OPAC	81
10	e books	81
11	Periodicals	97

12	news papers	97
13	full text data base	82
14	scholarly websites	82
15	directories	86
16	email/social media	91
17	publications	97
18	cataloguing	99
19	research	98
20	babiliography	88

Table 4 provides a comprehensive overview of the various Information and Communication Technologies (ICTs) and related services available in university libraries across the Haridwar district. The data reveals a well-established ICT infrastructure, with certain services being nearly universally present. Cataloguing (99), research support services (98), publications (97), periodicals (97), and newspapers (97) are the most commonly available resources, indicating that libraries are effectively supporting academic and research activities through both traditional and digital means. A strong digital presence is also evident in the availability of computers (91), internet facilities (89), network services (89), and email/social media services (91), which are essential components for digital learning environments.



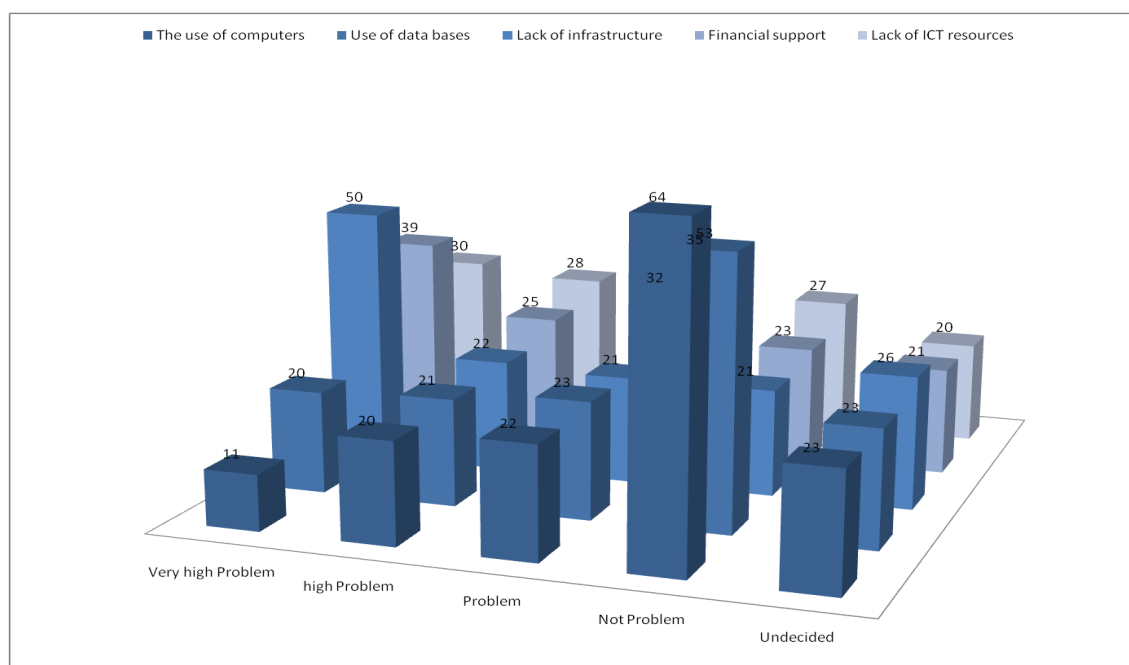
Graph 4: Analysis Of ICTs present in libraries of Haridwar District

Additionally, resources such as e-journals (81), OPAC (81), e-books (81), and full-text databases (82) highlight that libraries are actively transitioning towards digital content to meet the modern research needs of students and faculty. Support services such as student help desks (71) and technical help desks (65) suggest efforts toward user assistance and IT support. However, some basic services like Xerox (65) and printers (78) show slightly lower frequencies, indicating that while digital access is prioritized, physical support services still require more attention in some libraries. The presence of scholarly websites (82), directories (86), and bibliographic tools (88) further underscores the academic orientation and ICT readiness of libraries in the region. Overall, the data reflects a well-developed ICT ecosystem in university libraries of Haridwar, though there remains scope for enhancing consistency and ensuring uniform availability of all essential services across institutions.

**Table 5:** ICTs use and respondents reaction on library facilities of Haridwar District

Items	Very high Problem	high Problem	Problem	Not Problem	Undecided
The use of computers	11	20	22	64	23
Use of data bases	20	21	23	53	23
Lack of infrastructure	50	22	21	21	26
Financial support	39	25	32	23	21
Lack of ICT resources	30	28	35	27	20

Table 5 presents the perceptions of respondents regarding various aspects of ICT use and related challenges within university libraries in Haridwar district. The data indicates that **the use of computers** is largely seen in a positive light, with **64 respondents stating it is 'Not a Problem'**, although a combined **53 respondents** (11 + 20 + 22) still identify it as a concern to varying degrees. Similarly, regarding **use of databases**, **53 respondents** do not find any issue with their use, whereas **64 respondents** (20 + 21 + 23) express difficulties, which shows a slight imbalance in comfort or accessibility levels among users. However, the concerns become more pronounced when examining infrastructural and resource-related challenges. **Lack of infrastructure** emerges as the most significant problem, with **50 respondents rating it as a 'Very High Problem'** and **22 as a 'High Problem'**, clearly indicating that many university libraries still face fundamental challenges in establishing or maintaining adequate ICT infrastructure. Similarly, **financial support** is flagged as a substantial issue, with **39 respondents indicating a 'Very High Problem'** and **25 noting a 'High Problem'**, suggesting that limited funding continues to be a barrier to the optimal implementation of ICT tools and services. The issue of **lack of ICT resources** reflects a similar pattern, where **93 respondents** collectively acknowledge it as a problem to some degree (30 very high, 28 high, 35 moderate), while only **27 respondents** report no problem. This highlights a persistent gap in the availability of essential digital resources. Across the board, a notable number of respondents remain **undecided**, ranging from 20 to 26 per item, which may reflect a lack of awareness or engagement with ICT facilities. Overall, while there is evidence of successful ICT integration in some areas (especially computer and database use), significant challenges related to infrastructure, funding, and resource availability continue to affect the efficacy and accessibility of ICT services in Haridwar's university libraries.



**Graph 5:** ICTs use and respondents reaction on library facilities of Haridwar District

From the above table it can be seen that 64 (45.71 %) respondents say there is not Problem in use of computers, followed by 23 (16.42%) for undecided, while 22 (15.71%) for some that score for Problem, high Problem score 20 (14.28%) respondents, and very high Problem score 11 (7.85%) respondents. On the use of data bases, 53 (37.85 %) respondents score not Problem, followed by 23 (16.42 %) respondents for each score to Problem and undecided. High Problem score 21 (14.99 %) respondents, while very high Problem score 20 (14.28 %). Lack of infrastructure 50 (35.71%) respondents say there is very high Problem, followed by 26 (18.57 %) who score for undecided, while 22 (15.71%) respondents for high Problem, rest of the option that are



problem and not problem each score 21 with (14.99 %) respondent. Financial support 39 (27.85 %) respondents score for very high Problem, followed by 32 (22.85%) respondents who score to Problem. High Problem score 25 (12.19%) respondents, while not Problem scores 23 (16.42 %) respondents, rest of the option that is undecided score 22 (14.99 %) respondents. Online acquisition techniques 35 (24.99 percent) respondents score for problem, followed by 10 (24.39 %) respondents who score for very high problem, High problem score 28 (19.99) respondents, while not problem score 27 (19.28 %) respondents, and undecided score 20 (14.28 %) respondents.

### **III. Conclusion**

The study concludes that the use of ICTs in university libraries of Haridwar district is progressing, yet unevenly distributed across institutions. While some universities have embraced digital transformation through automated systems, e-resources, and online catalogs, others still rely heavily on traditional methods due to infrastructural limitations and insufficient staff training. Users, particularly students, express a growing need for better digital resources and skill-building opportunities. Key issues such as inconsistent internet connectivity, lack of awareness about digital tools, and limited budget allocation hinder optimal utilization of ICT services. The research underscores the urgent need for capacity-building initiatives, periodic ICT training workshops, and government-backed policies to create a more robust digital library ecosystem. Bridging the digital divide within university libraries will not only improve academic performance but also promote inclusive and equitable access to knowledge for all users in the Haridwar district.

ICTs have undoubtedly changed the information management landscape all over the world. However, the reality in developing cities like haridwar has not been encouraging, although there have improvements in recent times. From the findings of this study, it can be seen that librarians' use of ICTs for information service delivery depends largely on their attitude to technology. With positive attitudes librarians tend to use available ICTs effectively while negative attitudes have capacity to leave available ICTs unused or underused for information service delivery. Factors that lead to attitude formation such as exposure to ICT, training, and peer influence are controllable factors; hence, ICT utilization by librarians can be tremendously increased when attention is paid to these factors.

### **Suggestions from the Librarian**

Some of the suggestions given by different library professionals were:

1. Since ICT based services are very much needed in today's society, each and every library professionals should aware of it;
2. Qualified and competent manpower of the library and more funds are very much needed for the development of the library;
3. The Government should make a plan to develop the College library as University library. Since library bring better education in the country;
4. Application of SOUL software and expansion of library building;
5. To organized the college library for library automation in collaboration with UGC (INFLIBNET);
6. The Government should sanctioned separate fund for library development and enable to provide better service to the user;
7. Every library should be automated so that work of staff became easier and the user can get their information at right time; and
8. Library must employ modern library technique and device in its operation. So that it provide service in order to save time of library user and the staff because manual system is time consuming.

### **References**

- [1]. Mathieson, C.K. (2011) Computer anxiety and attitudes towards microcomputer use. *Behaviour and Information Technology*. 9:3. pp. 229-241.
- [2]. Omoniwa, M. A. (2001). The computerization of Kashim Ibrahim Library of Ahmadu Bello University, Naria, 1972-2001, Nigerian Libraries. *Journal of Nigerian Library Association*, Vol. 35 NO. 1, 15-22.
- [3]. Attwell F.K. and Rule, G.S. (2004) Occupational role stress on women librarians: a study. *SRELS. Journal of Information Management*. 40:2 : 201- 14.
- [4]. Bigozzi, C.O., Davis A.L. and Warshaw, L.S (2012). Techno stress in libraries: Causes, effects and solutions. *The Electronic Library*, 5, pp. 282-7.
- [5]. Cholin, V.S (2005), study of the application of information technology for effective access to resources in India in university libraries. *The International Information & Library Review*, 37(2),pp.189-197.
- [6]. Ramzan M. (2004) Does level of knowledge impact librarians' attitude toward Information Technology (IT) applications? 2nd International CALIBER- 2004, New Delhi, 11-13 February.
- [7]. Spacey, R., Goulding, A., & Murray, I. (2013). ICT and change in UK public libraries: Does training matter? *Library Management*. 24:1&2, pp. 61- 69.
- [8]. Taiwo I.O. (2008) Information technology in public libraries. *Program*30: 2, pp. 121-31.
- [9]. Ansari, M. A., & Zuberi, B. A. (2010). Use of ICTs in libraries: A survey of selected libraries in Karachi. *Pakistan Journal of Library & Information Science*, 11(1), 1-8.

- [10]. Bavakutty, M., & Salih, M. (1999). Internet services in Calicut University: A study. *Library Progress (International)*, 19(2), 125–128.
- [11]. Bhatti, R. (2013). Internet use among faculty members in the University of Sindh, Jamshoro, Pakistan. *Library Philosophy and Practice*, 1–12.
- [12]. Dadzie, P. S. (2005). Electronic resources: Access and usage at Ashesi University College. *Campus-Wide Information Systems*, 22(5), 290–297. <https://doi.org/10.1108/10650740510632107>
- [13]. Haridasan, S., & Khan, M. (2009). Impact of ICT on library and information science: A study of the progress, challenges, and opportunities. *The Journal of Library and Information Technology*, 29(2), 85–89.
- [14]. Hussain, A., & Kumar, K. (2010). Use of ICT in libraries: An empirical study of selected libraries in Delhi. *International Journal of Library Science*, 5(3), 211–219.
- [15]. Islam, M. S., & Panda, K. C. (2007). IT in university libraries of Bangladesh: A study of the implementation, problems and impact. *Program: Electronic Library and Information Systems*, 41(4), 385–392. <https://doi.org/10.1108/00330330710840203>
- [16]. Kaushik, A., & Kumbar, B. D. (2013). Use of ICT in library services: A study of select engineering colleges in Mysore city. *International Journal of Library and Information Studies*, 3(3), 1–7.
- [17]. Khan, S. A., & Bhatti, R. (2012). Application of ICT in university libraries: A case study of Pakistan. *Chinese Librarianship: An International Electronic Journal*, 34, 1–9.
- [18]. Kumar, A. (2011). ICT and its impact on library and information science: A study of the changing role of LIS professionals in India. *Library Herald*, 49(2), 160–169.
- [19]. Mahapatra, R. K., & Panda, K. C. (2001). State of ICT in libraries of engineering institutions in India. *Annals of Library and Information Studies*, 48(3), 109–116.
- [20]. Nwagwu, W. E. (2006). Integrating ICTs into the globalization of the poor developing countries. *Information Development*, 22(3), 167–179. <https://doi.org/10.1177/0266666906066818>
- [21]. Prasher, R. G. (2003). *Information and its communication*. Medallion Press.
- [22]. Sinha, M. K. (2012). ICT in libraries: A comparative study of select academic libraries in India. *Journal of Library and Information Science*, 37(2), 157–167.
- [23]. Thanuskodi, S. (2012). Use of ICT among faculty members in arts and science colleges in Tamil Nadu. *International Journal of Information Science and Management*, 10(1), 61–76.