Review Article

Library Science & ICT

# UTILIZATION OF ICT LIBRARY SERVICES IN THE FIELD OF LIFE SCIENCES IN THE SELECTED UNIVERSITY LIBRARIES OF UT OF JAMMU AND KASHMIR

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The Life Sciences are helpful in improving the quality and standard of life. They have the applications in agriculture, health, medicine, pharmaceuticals and food science industries. The proposed research study attempts to understand the perception of users towards application of Information Communication Technologies (ICT) in the field of Life Sciences of various University libraries of UT of Jammu and Kashmir. Information Communication Technologies have changed the traditional methods of library activities and services providing new dimensions for teaching, learning and research in higher educational institutions. The main objectives of the present study were to find out the usage and frequency of ICT based library services by the library users. It further states their source of training for using ICT based library services and the most preferred mode of communication for use of the ICT based digital library services for research, study or teaching. For study closed and open-ended questionnaire was framed to seek quantifiable information and opinion of users on ICT based information sources and services. About 525 questionnaires were distributed to the users of various universities under study. Of these 490 questionnaires were received back duly filled thereby making the response rate of 93.33%.The data so collected was analyzed and tabulated with the help of various mathematical and statistical techniques .With the help of ICT tools, it is possible to store, retrieve, disseminate and organize information by creating websites and databases. Information is now published both electronically and printed format thereby making it accessible to users according to their demands. This study is helpful in reorienting information and communication technologies, library services and activities to synchronize them with information seeking behaviour of their user's i.e. teachers, scientists, researchers and students.

**Keywords:** Information Communication Technology, Library Services, Library Users, Source of Training, ICT Use, Mode of Communication

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## Introduction

Today we are living in the age of information. A large amount of information is being generated every moment. The information may be in the form of book and non-book materials. The information is a dynamic and an unending resource that affects all disciplines and all walks of life. Information supports education, research and development. The main function of library is to acquire information from various sources and arrange, process, disseminate them to satisfy the needs of students, academicians and researchers in the right form and at the right time. Information sharing is achieved through networks. The progressive increase in the use of information and communication technologies (ICT) in education has drastically changed the teaching and learning process. ICT plays a vital role in bringing out changes in our society. Information and Communication Technologies play an important role in information processing and retrieval systems.

## Relevance of ICT in Libraries

The Information Communication Technologies that are relevant to libraries mainly cover the following:

- Computer Technology;
- Telecommunication Technologies;
- Reprographic Technologies;
- Library Technologies;
- Media Technologies;

The activities and services in libraries in which these technologies are used are indicated in Fig 1.

Fig.1: Relevance of ICT in Libraries

*Enclosed as Annexure 01*

## Review of the Existing Literature

Literature search plays a very important role in research activities, as it forms the very first step of research pursuit. A thorough review of literature is very essential in conducting a new research. Considerable amount of literature is available regarding application of Information Communication Technology (ICT) in libraries, professional development and continuing educational

Needs of library professionals. Some of the worth mentioning studies which are reviewed and deserve to be mentioned are as follows:

(Jones & Umoh, 2022) revealed that in this era of globalization, in which the world is connected; information gains its power through permanent storage and wide distribution, which could be achieved through ICT. The study concluded that ICT is a generic term that refers to the technologies that are used to collect, store, edit, and communicate information in various formats. Libraries have become one of the institutions mostly used to manage, disseminate, and preserve knowledge. The library's collection comprises both the physical materials and all digital or electronic information resources and services that the library provides. The study also recommended that in order to achieve sustainable development the government should adopt the role of ICT in the provision of library services, allocate resources for the creation of digital libraries, provide training and conduct awareness programs to emphasize the value of digital libraries. (Adeniran et al., 2020)investigated application of Information and Communication Technology (ICT) in selected libraries in Kwara State. The descriptive survey design was adopted for the study and population comprised of seven academic libraries in Kwara State. Result from the study shows that most of the academic libraries in Kwara State are in developed stage in terms of provision of ICT facilities. Despite this fact, the study reveal that majority of the surveyed academic libraries were lack computerized security door with 0.0% and smart board with 9.6% while the availability of all other ICT facilities are rated high especially computer system, CD/DVD, internet connectivity and slide projector with 100%, CCTV camera with 95.2%, electronic database with 92.8%, library automation software with 91.5% and barcode sensor reader with 73.5%. The study concluded that provision of adequate ICT facilities in academic libraries will revolutionize effective information service delivery and the advancement in the use of ICT in day-to-day operations in academic libraries will dramatically enhanced information provision to the library users.(Alahakoon & Somaratne, 2020) in their study measured the levels of sources of ICT self-efficacy of undergraduates in Humanities and Social Sciences (HSS) of universities especially in Sri Lanka has not been adequately explored. The results

Identified four factors affected with the efficacy level of the undergraduates. It indicated that the ICT Self-efficacy levels and ICT Anxiety were varying between less (22%) and highest (50%) across universities. Factors such as ICT Training (27%) and Library Support provided (32%) by the universities were also in the lowest level. The ICT Self-efficacy was low (29%) among students who used the library 'rarely' (< 2 per week) and average level of anxiety 47%. ICT Anxiety and ICT Self-efficacy were the most strongly correlated factors in the study (-0.144, p = 0.01). However, the gender was largely diluted and not correlated with self-efficacy. The introduction of effective Library Support and ICT Training would help reduce the higher levels of ICT Anxiety and improve the ICT Self-efficacy level among undergraduates. The study recommends conducting a cross-sectional, longitudinal research study to better understand the levels of ICT Anxiety, ICT Training and the Library Support.(Janakiraman & Subramanian, 2020) in their paper revealed Information and communication technology (ICT) is a top priority in building the new global economy and constructing swift changes in society. The effective application of ICT in research development libraries and information centers has improved the ways and techniques of research information controlling. The main objective of Research and Development Institutions (R&D) libraries is to appropriately process and retrieve the information and to make available the much-required information to the research community. This study (Al-Qallaf and Al-Azmi, 2002) revealed the implementation and utilization of Information Communication and Technology (ICT) methods in R&D libraries in Chennai, and the level of the extent of ICT in these libraries and also suggested the modern techniques to be implemented. Knowledge can be divided into two categories namely explicit and tacit. This paper prospects how ICT and related systems can maintain libraries aspire towards excel administration of ICT management systems. The results show that ICT could play an important role in the library system, to be used broadly in the R&D libraries. Government and semi-government institutions standards can improve drastically through these ICT enabled libraries, (Ani VA et al (2016) so that the researchers can use this research information retrieval through ICT tools. As per the surveyed librarians, this paper suggests that more modern technology can be used

In the R&D libraries which can contribute more successful ICT application use to the research community. This technology has made extensive changes in each and every one, discipline and knowledge. In that scenario nowadays the library and information science is also demanding automatically in those operations. (Babel P, 2011). The ICT tools have nowadays become an important technology in R&D libraries as it plays a very significant role in meeting information requirements of the research communities and institutions as a whole. This study has identified the ICT structure and implementation R&D Libraries across Chennai. (Jindal et al., 2020) aims to survey the central universities and compare the awareness of the patrons regarding the ICT enabled information services provided by the university libraries. Content analysis of the website, structured questionnaires for librarians were used to find out the ICT enabled services facilitated by the libraries. The survey was accomplished through a structured questionnaire for the patrons prepared with the help of review of literature. For the study, universities were selected through the NIRF 2017 of MHRD. Five ICT enabled services were selected and studied keeping in view their benefits to the patrons. Review of earlier researches helped in selecting the services for comparative study. The data was collected through a matrix with three categories as 'Aware and Useful', 'Aware but not useful' and 'Not aware'. The data so collected through these categories also helped the researcher in finding out the usefulness of the ICT information services facilitated by the libraries. The findings revealed that 69.9% of patrons are aware of the selected and studied ICT enabled information services and only 50% of patrons find them useful too. They recommended to the university libraries to promote their ICT enabled information services so that to increase the awareness of patrons and their usage also. The marketing may be through user orientation and education, various information literacy tutorials, organizing various events, seminars and hands-on workshops for the patrons will support the cause of promotion of ICT enabled information services. Various tools and technologies of web 2.0 (vix.Youtube, facebook, blogs, instant messaging, social media platforms) may be used to promote the university library resources and services. These activities and technologies may be used to outreach the patrons, make them aware about the advantages of using

These services. Feedback must be taken from the patrons about the services so as to remove any shortcoming as well as to innovate and improve them. Revolutionary transformation in ICT has given a valuable chance to the library professionals for better control, coordination of the services and more improvement in the services. They need to update themselves with the changes in the technologies. This comparative study concludes that irrespective of the usefulness of the ICT enabled information services being provided by university libraries, overall their only 69.9% patrons are aware of them. University analysis presents that 81.29% patrons of JMI are aware of the services, followed by 70.91% of JNU and only 58.05% patrons of DU are aware of the information services studied for this paper. They all need to make efforts and improve the scenario by marketing and promotional activities. They need to be more visible online to their tech savvy generation of patrons.(Naqvi et al., 2020) in their study described that Information Communication Technology (ICT) infrastructure plays an important role to facilitate the adoption and sustainability of users' information seeking behavior. ICT helps students to access the quality of information sources available online. The survey study was carried out with an objective to assess the students' behavior and expertise towards adopting information communication technology at the three different public sector universities of the South Punjab. These universities were; The Islamia University of Bahawalpur, The Government Sadiq College Women University of Bahawalpur, and Bahauddin Zakariya University of Multan. The important variables of the study were students' behavior, skills, literacy, usage, effects and problems. Collected data analyzed using Statistical Package for Social Sciences. results of the study concluded that majority of the respondents' expertise were good in using ICT e.g., searching, access, storage information, use of internet application, telecommunication and networking, simple and advanced searching, and discovery tools. The use of ICT improves quality of information, improve the relevance of research, awareness of different field of knowledge, reduce digital divide, and improve information seeking behavior.(Rahman et al., 2020)in this paper aims to show the status of information communication technology (ICT) application in some selected University libraries and Special Libraries of Assam. The paper focuses on the application

Of ICT and the ICT based services to the libraries. This paper discusses about different ICT tools and their use in the library operations, how the library services are developed with the use ICT have discoursed in the study. The present study discusses various library operations using ICT. The purpose of this study is to express the usefulness of the different ICT tools and techniques for making the access of information quicker and accurate to the user community as well as efficient management of the systems and services of the library. (Ezekwe, 2019) inspite of the vital role ICTs play in University libraries, it is still difficult to have access to the required resources. In this regard, it is also difficult to determine the level of availability and utilization of ICT resources in the university library of Anambra State University. This research titled "Availability and Utilization of ICT Resources by undergraduate library users is therefore necessitated by the need to create records that will serve as empirical evidence of identified level of availability and utilization of the ICT resources in the library. To investigate this, exploratory survey research design was adopted, with questionnaire as the tool used for data collection. The questionnaire was constructed and validated in both content and face validity. The reliability of 0.96 was statistically determined by the use of Kurdar Richardson correlation (KRCC) formula. The sample size of the study was 378 derived from proportionate and stratified sampling techniques. 378 copies of the questionnaire were distributed to the respondents and (370) were returned valid. The research tested one hypothesis using Pearson Product Moment Correlation (PPMC) and analyzed seven research questions using descriptive statistic (frequency tables and per cent ages). The findings of the work questionnaires showed positive relationship between availability and utilization of ICT resources. Findings of the research show that some ICT resources like computer, printer, scanning, machine, photocopiers. CD Rom Internet connectivity etc were available and that they used these resources under constraints of inadequacy, lack of ICT knowledge by the students, limited work stations, poor service delivery etc. to execute class assignments, research etc. The students did not derive full satisfactory services owing to these constraints. The research recommends the expansion of ICT facilities and adequate financial base, training of students on the use of ICT components, providing reliable power, placing the internet service on regular subscription

And employing experienced digital librarian to man the ICT unit of the library. (Mahanta, 2019)in his paper explored that College education plays an important role in developing the knowledge power of any individual in a society. The libraries of academic institutions are not confined only to printed information sources; in fact, they have started acquisition and management of digital or electronic or virtual information resources. Thus the College libraries are able to fulfil the needs of the students, teachers and researchers by providing different kind of printed or digital resources. Better and effective library services can be ensured by the application of information and communication technology (ICT) with skilled and qualified library manpower. The technological aspect of ICT has created few challenges in the college libraries especially in Assam. The study covers the degree colleges which have been imparting general education in Assam. At present, there are 295 provincialised and 3 government degree colleges imparting general education in Assam. In total 189colleges were provincialised before 2012. The study covers the 3 government and 189provincialised degree colleges in Assam. The total number of colleges covered under the study is 192. The study investigated the ICT Infrastructure and Services in the College Libraries of Assam. This will identify the availability of ICT infrastructure facilities, ICT based library services performed by the college libraries and the barriers associated with the implementation of ICTs in the college libraries of Assam.(Meenambigai, Yeshwanth, and Thatchinamoorthy, 2017)in their study states thatICT is a significant component in the education development in order to prepare the citizens for the tomorrow. Higher education plays a crucial role in the development of a nation, as it is viewed as a dominant means to construct knowledge-rich society. The significant findings of this study indicated that majority of the staff and students had positive attitude towards ICT and the favourable attitude statements received highest mean scores and negative approach statements received optimum mean scores. The overall knowledge level of staff and students regarding ICT tools was found to be average. (Demeke, Olden and Nocera, 2016)in their study revealed that in Africa the adoption of Information and Communication Technologies (ICTs) varies considerably from one country to another, for example between Kenya

And Tanzania on the one hand and Ethiopia on the other hand. In Kenya and Tanzania telecommunications systems have been liberalized, while in Ethiopia all ICT infrastructures and services are provided by one single telecommunication operator and that is owned and run by the government. ICT plays a significant role in poverty reduction and empowerment of the disadvantaged, but this requires that ICT has first to be adopted by them. This paper provides insights into the impact of a monopolized telecommunications service can have on the adoption of ICT.(Haneefa and Syamili, 2014)in their study investigated the use of information and communication technology (ICT) by the visually impaired students in Calicut University, Kerala. The study found that a majority 80 (86.02%) of the students were computer literates, while a very few 13 (13.98%) were computer illiterates. The ICT plays an essential role in education, life-long learning, work and leisure. Rapid developments in ICT especially in portable hand held devices, improvements in voice and magnification software, and accessible websites present tremendous opportunities for visually-impaired students. It is analyzed that a large majority 88 (94.62%) of the students use mobile phones frequently and 37 (39.78%) students us desktop computers and 40 (43%) students use CD-DVD frequently. A very few students use laptop computers (12.9%) and e-books (11.83%).(Shukla and Gautam, 2008)in their paper states that Rural India is at a critical stage. It is large in size; problems are aplenty, the challenges are daunting and thus can present a scary picture to an outsider. But if enabled, it has the potential to transform itself quickly. Technologies exist today to provide telephony and internet in every village. It is stated that power supply is the one that requires most careful attention. ICT initiatives in rural areas cannot get far without solving the problems associated with power. Findings of the study suggest that the poor favour informal networks of trusted family, friends and local leaders over formal sources of information, such as NGO, newspaper or politicians. Advanced ICTs (internet and computers) were used only by 2% of low income households. It was found however, that while the poor rely on informal networks; these networks do not adequately satisfy their information needs. The poor would like more information regarding transportation; education; health & sanitation facilities in addition to agricultural

Practices, markets and prices. (Babu, Vinayagamoorthy and Gopalakrishnan, 2007) in their article examined that Library and Informational professional today need to acquire knowledge and skills in Information and Communication Technologies as the services of more and more libraries are now centering on Information Communication Technologies, especially in educational institutions. Applications of ICT in academic environment in India have increased gradually in the recent decades, more particularly in Tamil Nadu. This paper examines the ICT skills among librarians in engineering educational institutions in Tamil Nadu. The analysis of the data represents the extent and the level of ICT skills possessed by the librarians of these institutions. It is further suggested that librarians should be encouraged for upgrading ICT skills by their respective managements.

## Scope and Limitations of the Study

The scope of the study is limited to the Users of Life Sciences field in the Universities libraries of UT of Jammu & Kashmir. For gathering of information, data was collected from Librarian's, Faculty and Students. The data was collected from the following Universities of Jammu and Kashmir:-

01. University of Jammu, Jammu,

02. Central University of Jammu, Jammu,

03. SK University of Agricultural Sciences and Technology of Jammu, Jammu

04. Shri Mata Vaishno Devi University, Kakryal, Katra

05. University of Kashmir, Kashmir and

06. SK University of Agricultural Sciences and Technology of Kashmir, Kashmir

## Objectives of the Study

The following were the main objectives of the present study:-

01. To find out the usage of various library services by the library users.

02. To know the frequency of use of ICT based Library Services by Library Users.

03. To find out the level of skills and sources of training for using ICT based library services by the users.

01. To find outmost preferred mode of communication for use of the ICT based digital library services for research, study or teaching

## Research Methodology

For the purpose of this study, systematic method of reflective thinking and various other procedures were implied. Keeping in view the objectives of the study, the information and data was collected from number of primary and secondary sources such as journals, information brochures, books, pamphlets, newspaper, websites etc. In the present research paper an attempt is made to select random sampling method .A semi-structured questionnaire was framed and distributed to 525 users .Of these 490 questionnaires duly filled by the users were received back, making the response rate of 93.33%. Table 1 shows the response rate of questionnaires received back .The response of 93.33% users for the study is sufficient to get valid results.

**Table 1:** Distribution of Questionnaire and Responses Received from Library Users.

*Enclosed as Annexure 02*

After collecting the data, the data was organised and interpreted by using simple statistical methods.The collected data is then tabulated and systematically analyzed.

**Data Analysis and Interpretation**

The respondents were asked about since how long they have been using ICT Library Services. The response of respondents is indicated in Table 2 and Fig. 2.

**Table2:**Frequency Distribution of Responses on Usage of ICT based Library Services by Library Users

*Enclosed as Annexure 03*

**Figure 2:**Histogram of Frequency of Usage of ICT based Library Services by Library Users

*Enclosed as Annexure 04*

**Table 3:** Descriptive Statistics of Responses on Requirement of Training for the use of ICT based Library Services.

*Enclosed as Annexure 05*

From Table2 and Figure 2, it is reflected that

Out of 490 responses collected, 12(2.4%) respondents were using ICT based library services for less than 6 months, 24(4.9%) are using ICT based services from 6 months to 1 year, 278(56.7%) are using from 1 to 3 years, 20(4.1%) are using from 3 to 5 years and 156(31.8%) are using it from more than 5 years. The mean value of responses was recorded at 3.5796 with the standard deviation of 1.06188. The first two quartiles stand at 3 while the third quartile stands at 5.

The respondents were asked about their frequency of using ICT Library Services. The response of respondents is indicated in Table 4 and Fig.3.

**Table 4:** Frequency Distribution of Responses on Frequency of using ICT based Library Services.

*Enclosed as Annexure 06*

**Figure 3:** Histogram of Frequency of using ICT based Library Services.

*Enclosed as Annexure 07*

**Table 5:** Descriptive Statistics of Responses on Frequency of using ICT based Library Services.

*Enclosed as Annexure 08*

From Table 4 and Figure 3, it is indicated that out of 490 responses collected, 335(68.4%) respondents were using ICT based library services daily, 92(18.8%) were using ICT based services weekly, 32(6.5%) were using fortnightly, 18(3.7%) are using monthly and 13(2.7%) are using rarely. The mean value of responses was recorded at 1.5347 with the standard deviation of 0.95920. All the three quartiles for each variable also stand at 1 which represents a clear resonance of respondents with frequency of usage of various ICT based Library Users.

The respondents were asked about their Source of Training for using ICT based Library Services. The response of respondents is indicated in Table 6 and Fig 4.

**Table 6:** Frequency Distribution of Responses on Source of training for using ICT based Library Services.

*Enclosed as Annexure 09*

**Figure 4:** Pie Chart of Frequency of using ICT based Library Services.

*Enclosed as Annexure 10*

**Table 7:** Descriptive Statistics of Responses on Source of Training for the use of ICT based Library Services.

*Enclosed as Annexure 011*

From Table 6 and Figure 4, it is depicted that out of 490 responses collected, 45(9.2%) respondents received training/lessons from personal efforts and trial & error techniques, 29(5.9%) received assistance from friends and colleagues, 243(49.6%) received training through Library orientation programmes, 136(27.8%) received assistance from Library staff and 37(7.6%) from social media. The mean value of responses was recorded at 1.1857 with the standard deviation of 0.98672. All the three quartiles for each variable also stand at 1 which represents a clear resonance of respondents with training methods for usage of various ICT based Library Services and resources.

The respondents were asked about various ICT Library Services such as email, phone , voice mail, reprography, video conferencing ,fax, internet and social media  used for Study or Research or Teaching. The response of respondents is indicated in Tables 8-15and Fig. 5.

**Table 8:** Frequency Distribution of Response on Usage of E-mail facility in Library.

*Enclosed as Annexure 12*

**Table 9:** Frequency Distribution of Response on Usage of Phone facility in Library.

*Enclosed as Annexure 13*

**Table 10:** Frequency Distribution of Response on Usage of Reprography facility in Library.

*Enclosed as Annexure 14*

**Table 11:** Frequency Distribution of Response on Usage of Video Conference facility in Library.

*Enclosed as Annexure 15*

**Table 12:** Frequency Distribution of Response on Usage of Fax facility in Library.

*Enclosed as Annexure 16*

**Table 13:** Frequency Distribution of Response on Usage of Internet facility in Library.

*Enclosed as Annexure 17*

**Table 14:** Frequency Distribution of Response on Usage of Internet facility in Library.

*Enclosed as Annexure 18*

**Table 15:** Descriptive Statistics of Responses on the Use of ICT based Library Services for Research. Study or Teaching

*Enclosed as Annexure 19*

**Figure 5:** Histogram of Responses on use of ICT Library Services for Research, Study or Teaching.

*Enclosed as Annexure 20*

Above tablesfrom 8 to 15 and figure 5 reflects that out of 490 responses collected, majority of Users are regularly using Social Media 436(89%) followed by Internet 414(84%), E-mail 414(84%), Video Conferencing 360(73.5%), Reprography 284(58%), Fax 164(33.5%) and Phone 112(22.9%). The mean values of responses for E-mail, Phone, Reprography, Video Conferencing, Fax, Internet and Social Media were recorded at 1.7408, 1.3286, 1.0653 and 1.4408 respectively with the corresponding standard deviation of 0.36237, 0.42034, 0.49413, and 0.44195, 0.47237, 0.36237 and 0.31346. All the three quartiles for each variable also stand at 1 which represents a clear resonance of respondents with various Library facilities.

## Findings

1. Maximum number of respondents 278(56.7%) were using ICT based services from 1 to 3 years while minimum number of respondents 12(2.4%) were using ICT based library services for less than 6 months, as indicated from Table2 and Figure 2.

2. Majority of Users 243(49.6%) received training through Library orientation programmes, 136(27.8%) received assistance from Library staff and 37(7.6%) from social media as indicated from Tables 6 and Fig 4.

3. Maximum number of respondents 3335(68.4%) respondents were using ICT based library services daily, while minimum number of respondents 13(2.7%) are using rarely, as indicated from Table 4 and Figure 3.

4. Majority of Users are regularly using Social Media 436(89%) followed by Internet 414(84%), E-mail 414(84%), Video Conferencing 360(73.5%), Reprography 284(58%), Fax 164(33.5%) and Phone 112(22.9%) as indicated from Tables 8 to 15 and Fig 5.

## Suggestions

The applications of ICTs are increasing in academic libraries, especially in the university environment. Users' expectations have increased due to developments in technologies. The study recommends the following-

- The University Libraries must put efforts to bring awareness among the Users towards the ICT-based resources and services through Orientation programs, workshops, training sessionsetc

- The University Libraries must increase the availability of ICT infrastructure to enable the users to maximize the usage of ICT-based resources andservices.

- The libraries should implement digital library software. It is very useful to digitize rare collections such as older and out of print editions.

- The "Digital/Online Library Service" is one of the most useful services inthe university library system. Users can access digital resources subscribed by the libraries andopen access resources within library or from anywhere through remote login software such INFED, EZ-Proxy, Open Athens etc.

## Challenges of ICT in Libraries

- ICT Trained Manpower

- Library Budget/ Grants

- Copyright, Plagiarism

- Quick Information Delivery

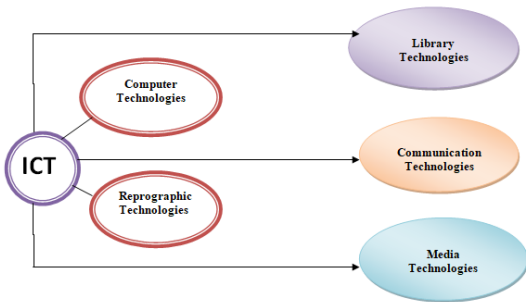- Digital Preservation of information Resources

## Conclusion

ICT has affected almost every sector of our life, transforming User's approach, dealings, etc. This ground-breaking change is also true in the case of Libraries. Libraries can barely function today without information communication technologies. In the present era, the library and information profession have transformed and accepted itself to the latest and innovative advances of ICT. These information communication technologies have attained the significant eminence. A well-resourced library with the services of modern information infrastructure and technologies could satisfy the utmost demand of its users.

## Annexures

*Annexure 01*

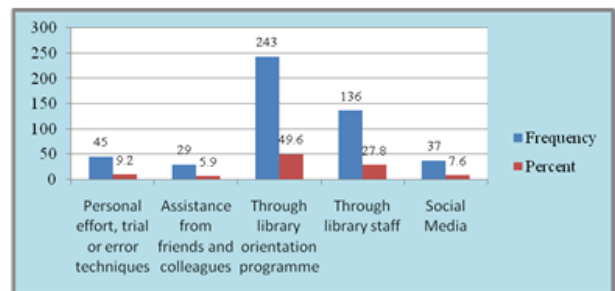Fig.1: Relevance of ICT in Libraries



*Annexure 02*

Table 1: Distribution of Questionnaire and Responses Received from Library Users.

| Description | Questionnaires Distributed | Responses Received | Response Rate (%) |
|---|---|---|---|
| Users | 525 | 490 | 93.33% |

*Annexure 03*

Table2:Frequency Distribution of Responses on Usage of ICT based Library Services by Library Users

| Frequency | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Less than 6 months | 12 | 2.4 | 2.4 | 2.4 |
| 6 months to 1 year | 24 | 4.9 | 4.9 | 7.3 |
| 1 to 3 years | 278 | 56.7 | 56.7 | 64.1 |
| 3 to 5 years | 20 | 4.1 | 4.1 | 68.2 |
| More than 5 years | 156 | 31.8 | 31.8 | 100.0 |
| Total | 490 | 100.0 | 100.0 | |

*Annexure 04*

Figure 2:Histogram of Frequency of Usage of ICT based Library Services by Library Users



*Annexure 05*

Table 3: Descriptive Statistics of Responses on Requirement of Training for the use of ICT based Library Services.

| Mean | | 3.5796 |
|---|---|---|
| Std. Deviation | | 1.06188 |
| Percentiles | 25 | 3.0000 |
| | 50 | 3.0000 |
| | 75 | 5.0000 |

*Annexure 06*

Table 4:Frequency Distribution of Responses on Frequency of using ICT based Library Services.

| Monthly | 18 | 3.7 | 3.7 | 97.3 |
|---|---|---|---|---|
| Rarely | 13 | 2.7 | 2.7 | 100.0 |
| Total | 490 | 100.0 | 100.0 | |

*Annexure 07*

Figure 3: Histogram of Frequency of using ICT based Library Services.



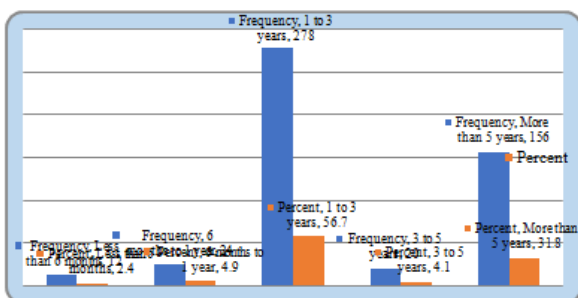*Annexure 08*

Table 5: Descriptive Statistics of Responses on Frequency of using ICT based Library Services.

| Mean | | 1.5347 |
|---|---|---|
| Std. Deviation | | .95920 |
| Percentiles | 25 | 1.0000 |
| | 50 | 1.0000 |
| | 75 | 2.0000 |

*Annexure 09*

Table 6: Frequency Distribution of Responses on Source of training for using ICT based Library Services.

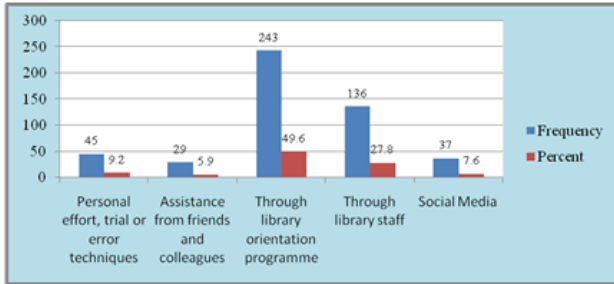| Source of Training | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Personal effort, trial or error techniques | 45 | 9.2% | 9.2 | 9.2 |
| Assistance from friends and colleagues | 29 | 5.9% | 5.9 | 15.1 |
| Through library orientation programme | 243 | 49.6% | 49.6 | 64.7 |
| Through library staff | 136 | 27.8% | 27.8 | 92.4 |
| Social Media | 37 | 7.6% | 7.6 | 100.0 |
| Total | 490 | 100.0 | 100.0 | |

*Annexure 10*

*Figure 4: Pie Chart of Frequency of using ICT based Library Services.*



*Annexure 11*

*Table 7: Descriptive Statistics of Responses on Source of Training for the use of ICT based Library Services.*

| Mean | | 3.5796 |
|---|---|---|
| Std. Deviation | | 1.06188 |
| Percentiles | 25 | 3.0000 |
| | 50 | 3.0000 |
| | 75 | 5.0000 |

*Annexure 12*

*Table 8: Frequency Distribution of Response on Usage of E-mail facility in Library.*

| Response | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Yes | 414 | 84.5 | 84.5 | 84.5 |
| No | 76 | 15.5 | 15.5 | 100.0 |
| Total | 490 | 100.0 | 100.0 | |

*Annexure 13*

*Table 9: Frequency Distribution of Response on Usage of Phone facility in Library.*

| Response | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Yes | 112 | 22.9 | 22.9 | 22.9 |
| No | 378 | 77.1 | 77.1 | 100.0 |
| Total | 490 | 100.0 | 100.0 | |

*Annexure 14*

*Table 10: Frequency Distribution of Response on Usage of Reprography facility in Library.*

| Response | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Yes | 284 | 58.0 | 58.0 | 58 |
| No | 206 | 42.0 | 42.0 | 100.0 |
| Total | 490 | 100.0 | 100.0 | |

*Annexure 15*

*Table 11: Frequency Distribution of Response on Usage of Video Conference facility in Library.*

| Response | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Yes | 360 | 73.5 | 73.5 | 73.5 |
| No | 130 | 26.5 | 26.5 | 100.0 |
| Total | 490 | 100.0 | 100.0 | |

*Annexure 16*

*Table 12: Frequency Distribution of Response on Usage of Fax facility in Library.*

| Response | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Yes | 164 | 33.5 | 33.5 | 33.5 |
| No | 326 | 66.5 | 66.5 | 100.0 |
| Total | 490 | 100.0 | 100.0 | |

*Annexure 17*

*Table 13: Frequency Distribution of Response on Usage of Internet facility in Library.*

| Response | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Yes | 414 | 84.5 | 84.5 | 84.5 |
| No | 76 | 15.5 | 15.5 | 100.0 |
| Total | 490 | 100.0 | 100.0 | |

*Annexure 18*

*Table 14: Frequency Distribution of Response on Usage of Internet facility in Library.*

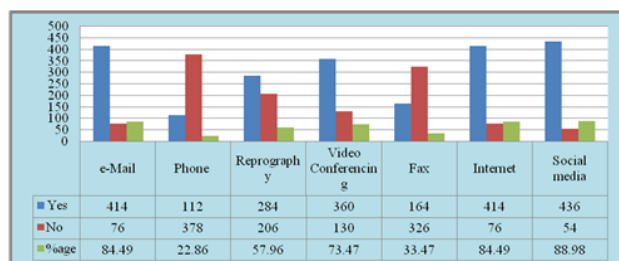| Response | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Yes | 436 | 89.0 | 89.0 | 89 |
| No | 54 | 11.0 | 11.0 | 100.0 |
| Total | 490 | 100.0 | 100.0 | |

*Annexure 19*

*Table 15: Descriptive Statistics of Responses on the Use of ICT based Library Services for Research. Study or Teaching.*

| Do you use following services in Library for research, study or teaching? | | E-mail | Phone | Voicemail | Video Conferencing | Fax | Internet | Social Media |
|---|---|---|---|---|---|---|---|---|
| Mean | | .8449 | .7286 | .5796 | .7347 | .8347 | .8449 | .8898 |
| Std. Deviation | | .36237 | .42034 | .49413 | .44195 | .47237 | .36237 | .31346 |
| Percentiles | 25 | 1.0000 | 1.0000 | 1.0000 | .0000 | 1.0000 | 1.0000 | 1.0000 |
| | 50 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| | 75 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |

Annexure 20

*Figure 5: Histogram of Responses on use of ICT Library Services for Research, Study or Teaching.*



| | e-Mail | Phone | Reprography | Video Conferencing | Fax | Internet | Social media |
|---|---|---|---|---|---|---|---|
| Yes | 414 | 112 | 284 | 360 | 164 | 414 | 436 |
| No | 76 | 378 | 206 | 130 | 326 | 76 | 54 |
| %age | 84.49 | 22.86 | 57.96 | 73.47 | 33.47 | 84.49 | 88.98 |

# Reference

Adeniran, C. O. , Nwalo, K. I. *N., & Ajani, Y. A. (2020). Application of Information and Communication Technology in Academic Libraries in Kwara State, Nigeria: Progress and Challenges. MBJLIS – Middlebelt Journal of Library and Information Science, 18, 70–88 [Crossref][Google Scholar]*

Ahmad, S. , & Ahmad, S. (2017). Status of ICT in the University Libraries of Khyber Pakhtunkhwa. *Pakistan Library & Information Science Journal, 48(2), 37–48 [Crossref][Google Scholar]*

Alahakoon, C. , & Somaratne, S. (2020). Measuring the levels of sources of ICT self-efficacy among the Humanities and Social Sciences undergraduates in Sri Lanka. *Journal of the University Librarians Association of Sri Lanka, 23, 1. [Article][Crossref] [Google Scholar]*

Babu, Ramesh B. , Vinayagamoorthy, P. & Gopalakrishnan, S. (2007). *ICT Skills among Librarians in Engineering Educational Institutions in Tamil Nadu, DESIDOC Bulletin of Information Technology, 27(6), 55-64 [Crossref][Google Scholar]*

Balachandar, P. , & Ramesh, R. (2019). Information and Communication Technology (ICT) in Library Operations Resources and Services in University Libraries. *Journal of Recent Academic Research, 1(7), 472–474 [Crossref][Google Scholar]*

Ezekwe, F. A. (2019). Availability and utilization of information and communication technology resources by undergraduate library users in Anambra State University libraries, Nigeria. *Library Philosophy and Practice, 2473, 1–34. [Article] [Crossref][Google Scholar]*

Haneefa, K. Mohamed & Syamilli, C. (2014). Use of Information and Communication Technology by Visually-impaired Students: A Study in University of Calicut, Kerala, DESIDOC Journal of Library & Information Technology, 34(4), 342-348. *[Crossref] [Google Scholar]*

Janakiraman, A. , & Subramanian, N. (2020). Application of information communication technology (ict) in libraries of research and development organizations in chennai - user study. *Pearl : A Journal of Library and Information Science, 14(3), 223–228. [Article][Crossref][Google Scholar]*

Jindal, R. , Khan, J. , & Roy, P. (2020). *Awareness of ICT Enabled Information Services Among Patrons: A Comparative Study of Central University Libraries of Delhi And NCR. International Journal of Research in Library Science, 6, 27. [Article][Crossref][Google Scholar]*

Mahanta, P. K. (2019). ICT Infrastructure and Services in the College Libraries of Assam: A Study. *Library Philosophy and Practice (e-Journal), 1–13. [Article][Crossref][Google Scholar]*

Singh, M. , Kadhim, M. M. , Turki Jalil, A. *et al. A systematic review of the protective effects of silymarin/silibinin against doxorubicin-induced cardiotoxicity. Cancer Cell Int 23, 88 (2023). https://doi.org/10.1186/s12935-023-02936-4 https://cancerci.biomedcentral.com/articles/10.1186/s12935-023-02936-4 [Article][Crossref][Google Scholar]*

Meenambigai, J. , Yeshwanth, S. S. G. , & *Thatchinamoorthy, C. (2017). Attitude, Knowledge and Extent of Utilization of ICT Tools Among the Staff and Students of Faculty of Agriculture, Annamalai University, Chidambaram, Cuddalore District, Tamil Nadu. Journal of Global Communication, 10(1), 26. [Article][Crossref] [Google Scholar]*

Naqvi, F. , Naeem, S. Bin, & Bhatti, R. (2020). *Students' Behavior and Expertise towards Information Communication Technology (ICT). Pakistan Library \& Information Science Journal, 51(1) [Crossref][Google Scholar]*

Rahman, M. , Choudhury, T. A. , & Barooah, P. *K. (2020). Status of Information Communication Technology (ICT) in some selected University Libraries and Special Libraries of Assam: A Comparative Study. Library Philosophy and Practice, 1–26 [Crossref][Google Scholar]*

Sami, Lalitha K. &Shahida (2007). Use of IT in Information Centres: Gender-Based Analysis, SRELS Journal of Information Management, 44(1), 43-52. *[Crossref][Google Scholar]*

Shukla, Saurabh and Gautam, J. N. (2008). Impact of Information Communication Technology in Rural Areas of Uttar Pradesh: Bridging the Divide, Library Herald, 46(4), 239-253. *[Crossref][Google Scholar]*