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srinivasa Raju chemarathi
chemarathi srinivasa raju, sreenuraj2002@gmail.com

Pulla Reddy V Prof.
Sri Venkateswara University

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An Opinion Survey of Faculty Members on ICT Facilities in the Libraries of Engineering Colleges Affiliated to JNTU – Anantapur, Andhra Pradesh, India

C. Srinivasa Raju

Librarian
Sri Venkateswara College of Engineering
Tirupati-517 507,
Andhra Pradesh, India
e-mail:sreenuraj2002@gmail.com

Prof. V. Pulla Reddy (Retd)

Dept. of Library and Information Science
Sri Venkateswara University
Tirupati-517 501,
Andhra Pradesh, India
e-mail:pullareddyv@gmail.com

Abstract

The purpose of the study is to examine the opinions of faculty members on ICT facilities in the libraries of Engineering colleges affiliated to JNTU – Anantapur, Andhra Pradesh, India. Survey method of research is used in the study. Questionnaire tool is used. Data is collected from a simple random sample of 1130 faculty members out of 5272 faculty members belonging to 37 engineering colleges affiliated to JNTU – Anantapur. Analysis of data reveals that most of the faculty members (96.8%) replied that their libraries use computers. Most of them (95.2%) replied that Internet facility is available in their libraries. Most of them (94.9%) replied that they utilize the Internet facility from their libraries. Most of them (95.3%) use Internet for teaching purpose. Majority of the faculty members (73.1%) use Internet daily. All the faculty members (100%) replied that ‘insufficient number of computer systems’ is the reason for not utilizing the Internet facility of their libraries. Majority of the faculty members (69.6%) opined that the ‘Department’ is the most convenient place for Internet browsing. Majority of them (69.2%) replied that their libraries provide OPAC facility. Most of them (78%) replied that digital library is available in their libraries. Majority of the them (56.2%) replied that printing facility is not available in their digital library. Among the faculty members, who replied that printing facility is available in their libraries, most of them (76%) informed that the cost collected for printing is Rs.1/- per page. Most of them (84.2%) replied that the access to NPTEL courseware is provided in their libraries. Majority of them (67.8%) replied that access to MIT open courseware is not provided in their libraries. Finally, a number of recommendations have been made to improve the ICT facilities in the libraries of engineering colleges affiliated to JNTU-Anantapur.

Keywords: User Survey, ICT facilities, Engineering faculty members, Engineering colleges, JNTU Affiliated colleges.

1.Introduction

Information and Communication Technology (ICT) is defined as a diverse set of technological tools and resources used to communicate, and to create, disseminate, store and manage information. The 21st century is ICT age. In this age, ICT has greatly affected the human life in various spheres. It has changed the life style as well as working environment of the people. It is widely being used in every industry, banking, government and educational sectors. Its application has profoundly influenced the performance of these sectors. ICT has altered the ways in which the

academic activities – teaching, learning, research and extension activities are carried out at higher education level.

Engineering college library as a subsystem of Technical education, should act as a trend-setter in adopting ICT for its activities. ICT offers ample opportunities for libraries to automate the various operations, implement efficient and effective library cooperation and resource sharing networks, develop institutional repositories, provide value-added information services and initiate capacity building programmes for library staff and library users. Adoption of ICT also enables libraries to reduce costs, enhance operational efficiency, and most importantly to improve service quality. ICT has helped to overcome the barriers of time and space and reduced the time-lag between the generation of information and its consumption by the end user. It enables the libraries to reduce their manual work and to provide their services faster. Right information to the right users at right time can be provided by using ICT.

Engineering college libraries should satisfy the information requirements of their users to enable them to carry out their endeavours in engineering by providing adequate ICT facilities. These libraries in Andhra Pradesh are spending a substantial amount in the provision of these facilities to their users. Due to unawareness and lack of skills, the users of engineering college libraries are not utilizing the ICT facilities to the maximum extent. Hence, there is need to conduct surveys on the users of these libraries to know to what extent ICT facilities are being used by them so that the suggestions can be made to maximize the use of these facilities and to improve the ICT based information services. In this context, the present survey entitled ‘An Opinion Survey of Faculty Members on ICT Facilities in the Libraries of Engineering Colleges Affiliated to JNTU – Anantapur, Andhra Pradesh, India, has been undertaken.

2. Review of Literature

Significant studies that were carried out on the topic of research were reviewed.

Arokyamary and Ramasesh [1] assessed the availability of IT Infrastructure among 133 Visveswaraiah Technological University engineering college libraries. Arundathi and Chandrasekhara [2] assessed Information and Communication Technology (ICT) literacy among professional college librarians in Southern

Karnataka. Das [3] made a study on engineering college libraries in Bhubaneswar, Odisha,

Kattimani and Ramesh Naik [4] made a study on the evaluation of managerial and ICT skills' competencies of the library professionals working in the Engineering College Libraries in Karnataka State. Kumar [5] conducted a survey on the librarians of engineering colleges in Andhra Pradesh, to observe their awareness on web 2.0 tools like blogs, Wikipedia, social networks and photo sharing. Lakshmi pathi and Ponnudurai [6] made a study on use of ICT resources and services by the faculty members of Sri Vidyanekethan Engineering College, Chittoor District, Andhra Pradesh.

Mahendra and Mahapatra [7] conducted a study to assess the impact of initiatives of digital libraries in the engineering colleges in order to give better library facilities. Mulla and Chandrashekara [8] made a study on the use of integrated library software (ILS) in 50 engineering college libraries of Bangalore region. Prasanna Kumar, Das and Ramesh [9] made a study on the assessment and application of Information and Communication Technology (ICT) and its problems in the Private Engineering and Management Colleges of Orissa.

Ravi kumar and Mahesh [10] conducted a study on user experience of library services of ACS College of Engineering, Bangalore (ACSCE). Rajeshwari and Ramesh Naik [11] studied ICT impact on College Libraries and Librarians of Bagalkot District, Karnataka. Raghunadha Reddy and Pulla Reddy [12] conducted a study on the use and availability of Information Communication Technology (ICT) facilities in engineering college libraries in S.V.University area.

Sivakumaraswamy and Narendra [13] studied the digital information services and resources at the BGS Institute of Technology (BGSIT), Karnataka. Stephen and Thanuskodi [14] conducted a study on the use of ICT by research scholars of Alagappa University, Karaikudi, Tamilnadu. Vasishta [15] conducted a study to find out the status of library automation and networked services at six technological deemed university libraries in North India.

Verzosa [16] made an assessment of De La Salle University Library's computerization planning process. Venkataramana [17] presented the results of a research study conducted on the impact of using IT on library housekeeping

operations and information services, in eight central university libraries in India. The study of Vijay kumar [18] reveals that majority of the faculty members use Internet for communication (86.9%), subject information (71.3%) and research (52.5%). Yadagiri [19] described the application of information technology (IT) in creation of database, housekeeping services such as circulation desk, OPAC etc., and introduction of latest IT infrastructure viz., Bar coding Technology, Digital Graphic Printer, Multimedia systems, CD-ROMs, Audio-Visual media, etc., in the Regional Engineering College Library, Warangal.

It is evident from the above review of literature that no study has been undertaken on the ICT facilities in the libraries of engineering colleges affiliated to JNTU-Anantapur. Hence, the present study has been undertaken.

3. Objectives of the Study

The following are the objectives of the study.

1. To examine the use of computers in the libraries of engineering colleges for their house keeping operations;
2. To examine the provision and utilization of Internet facility by the faculty members;
3. To examine the purpose, frequency and place of using Internet by the faculty members of engineering colleges;
4. To examine the provision of OPAC facility;
5. To find out the provision of a separate digital library in their engineering colleges.;
6. To know the provision of printing facility in their digital libraries;
7. To assess the provision of access to various coursewares in their libraries; and
8. To examine the differences, if any, among the various categories of faculty members of engineering colleges in their opinions on ICT facilities.

4. Methodology

Survey method of research has been adopted in the present study.

4.1 Selection of sample

The population of the study consists of faculty members of Engineering Colleges affiliated to Jawaharlal Nehru Technological University–Anantapur, Andhra Pradesh, India. There are 119 Engineering Colleges affiliated to JNTU- Anantapur as on 1-3-2015. These colleges are located in the districts of Anantapur, YSR (Kadapa),

Kurnool, Chittoor and Nellore. The investigator selected 37 engineering colleges out of 119 by simple random sampling. There are 5274 faculty members working in these 37 Engineering Colleges. As the population is large in terms of cost, time and labour involved, the investigator selected a sample of 1130 faculty members out of 5274 (21% of the population) using simple random sampling.

4.2 Data collection

Among the various methods of collecting primary data, questionnaire tool is used for collecting the required data for the present study. The questionnaire consists of questions on use of computers, Internet facility, utilization of Internet facility, purpose and frequency of Internet use, reasons for not utilizing Internet facility, convenient place for the use of Internet, OPAC facility, digital library, printing facility and coursewares. Copies of the questionnaire were distributed personally to the faculty members of these engineering colleges and the filled-in copies were collected from them. The investigator clarified the doubts raised by the faculty members at the time of filling up the questionnaire. The required data was collected from the faculty members.

4.3 Definition of terms used

The terms used in the present study have been operationally defined.

4.3.1 Faculty members

The faculty member is an educator who works at a college or university. In the present study, Assistant Professors, Associate Professors and Professors working in engineering colleges affiliated to JNTU – Anantapur are considered as faculty members.

4.3.2 Age

The faculty members are divided into three categories on the basis of their age. The faculty members whose age falls in the range of 22 to 30 years are termed as ‘low age group’ faculty members. ‘Middle age group’ faculty members are those whose age falls in the range of 31 to 40 years. The faculty members whose age is more than 40 years are termed as ‘high age group’ faculty members.

4.3.3 Gender

The faculty members are divided into men and women faculty members.

4.3.4 Qualification

The faculty members are divided into three categories on the basis of their qualifications. The faculty members who possess only B.Tech. degrees are treated as B.Tech faculty members. The faculty members who possess M.Tech degree are treated as M.Tech faculty members and Ph.D faculty members are those who possess Ph.D. degree.

4.3.5 Designation

The faculty members are divided into two groups on the basis of their designations. The faculty members who are designated as Assistant Professors are considered as junior faculty members. The faculty members who are designated as Associate Professors and Professors are considered as senior faculty members.

4.3.6 JNTU-Anantapur

JNTU stands for Jawaharlal Nehru Technological University, Anantapur. The engineering colleges located in the districts of Y.S.R. (Kadapa), Kurnool, Anantapur, Chittoor and Sri Potti Sriramulu Nellore are affiliated to this University.

4.3.7 Professional involvement

Professional involvement is defined as the involvement of an individual in various professional development activities namely participation in workshops, seminars/conferences, refresher courses and training programmes, the contribution of research papers in national and international journals, publication of books, possessing a doctoral degree and holding of membership in professional associations. In order to measure the intensity of professional involvement of an individual, the scores have been allotted for various professional development activities. A score of 15 has been allotted to the Papers published in International journals (for each paper); a score of 10 for the Papers published in national journals (for each paper); a score of 25 for the Papers published in seminars/conference proceedings (for each paper); a score 10 for the chapters published in books (for each paper or chapter); a score of 25 for the Subject books written /edited (for each book); a score of 10 for the holding of Ph.D Degree; a score of 5 for the participation in seminars/conferences/workshops/symposia/refresher courses/ training programmes (for each); and a score of 2 for the membership in Professional Associations (for each)

The total score for each faculty member has been calculated for all his/her professional development activities. The score has been termed as professional involvement score. Faculty members are divided into two groups on the basis of their professional involvement score. The faculty members who obtained the score in the range of 1 - 30 are known as 'Low Professional Involvement Group' faculty members and those faculty members who obtained the score in the range of 31–760 are known as 'High Professional Involvement Group' faculty members.

5. Analysis and Interpretation of Data

The collected data is analyzed and interpreted in the following paragraphs.

5.1 Use of Computers

Now-a-days everywhere computers are being used. In libraries also, computers are used for automating their housekeeping operations. Automation in libraries saves time, money and labour and enhances the efficiency of libraries. Hence, a question has been posed to the faculty members to know whether their libraries use computers. The responses made by them are shown in Table 1.

It is evident from Table 1 that most of the faculty members (96.8%) replied that their libraries use computers and the remaining of them (3.2%) replied negatively. The table also shows that there is no significant difference between junior and senior faculty members of engineering colleges in their replies with regard to the use of computers by their libraries. It is evident from Chi square value which is not significant at 0.05 level with 1 degree of freedom.

Table 1 also shows that there is no significant difference between men and women faculty members with regard to the use of computers by their libraries. Chi square value is not significant at 0.05 level with 1 degree of freedom. There is also no significant difference between faculty members who obtained low professional involvement score and those who obtained high professional involvement score in this regard. It is tested by Chi square value which is not significant at 0.05 level with 1 degree of freedom.

Table 1 also shows that there is no significant difference among the various age groups of faculty members with regard to the use of computers by their libraries. It is tested by Chi square value which is not significant at 0.05 level with 2 degrees of freedom. There is no significant difference between low age group and middle age

group faculty members in this regard. There are no significant differences between middle age and high age group faculty members on the one hand, and low age and high age group faculty members on the other hand in this regard. Chi square values are not significant at 0.05 level with 1 degree of freedom. It can be concluded that there is no significant association between the age of faculty members and their replies with regard to the use of computers by their libraries.

On the whole, there is no significant difference among the faculty members with various educational levels with regard to the use of computers by their libraries. It is evidenced by Chi square value which is not significant at 0.05 level with 2 degrees of freedom. There are no significant differences between B.Tech and M.Tech faculty members on the one hand and M.Tech and Ph.D faculty members on the other hand in this regard.

It is evidenced by Chi square values which are not significant at 0.05 level with 1 degree of freedom. There is a significant difference between B.Tech and Ph.D faculty members in this regard. The Chi square value is significant at 0.05 level with 1 degree of freedom. More number of B.Tech faculty members replied that their libraries are using computers compared to Ph.D faculty members. On the whole, it can be concluded that there is no significant association between the educational level of faculty members and their replies with regard to the use of computers by their libraries.

Table 1: Distribution of faculty members according to their responses with regard to the use of computers in their libraries.

Reply	Age group			Gender		Qualifications			Designation		Professional Involvement Group		Total
	22 – 30 Low	31 – 40 Middle	> 40 High	Men	Women	B. Tech	M. Tech	Ph.D	Junior	Senior	Low	High	
Yes	595 (97.1)	413 (96.5)	86 (96.6)	769 (96.7)	325 (97.0)	100 (100.0)	869 (96.8)	125 (94.7)	849 (96.8)	245 (96.8)	649 (97.6)	445 (95.7)	1094 (96.8)
No	18 (02.9)	15 (03.5)	3 (03.4)	26 (03.3)	10 (03.0)	0 (0)	29 (03.2)	7 (05.3)	28 (03.2)	8 (03.2)	16 (02.4)	20 (04.3)	36 (03.2)
Total	613	428	89	795	335	100	898	132	877	253	665	465	1130

Note: Figures in parentheses denote percentages.

Dependent	Variables		df	p Value	Table Value	Observation at 0.05 level
	Independent	Chi Square (X ²) Value				
Use of computers	Age	0.275	2	0.872	5.991	Not Significant
	<i>Low – Middle</i>	0.265	1	0.607	3.841	Not Significant
	<i>Low – High</i>	0.051	1	0.822	3.841	Not Significant
	<i>Middle – High</i>	0.004	1	0.950	3.841	Not Significant
	Gender	0.062	1	0.803	3.841	Not Significant
	Qualifications	5.215	2	0.074	5.991	Not Significant
	<i>B. Tech – M. Tech</i>	3.326	1	0.068	3.841	Not Significant
	<i>B. Tech – Ph.D.</i>	5.468	1	0.019	3.841	Significant
	<i>M. Tech – Ph.D.</i>	1.467	1	0.226	3.841	Not Significant
	Designation	0.001	1	0.980	3.841	Not Significant
	Professional involvement	3.186	1	0.074	3.841	Not Significant

5.2 Internet facility

A group of computers connected together for sharing the resources is called a network. Internet is a network of networks. One can get a considerable amount of information freely on any subject from websites, databases, e-books, e-journals, etc., through Internet. Engineering college libraries should provide Internet connectivity so that the users can utilize the services of Internet for getting the required information. A question has been posed to the faculty members to know the availability of Internet facility in their libraries. The responses made by them are shown in Table 2.

Table 2 shows, most of the faculty members (95.2%) replied that Internet facility is available in their libraries and the remaining of them (4.8%) replied negatively in this regard. The table also shows that there is no significant difference between junior and senior faculty members of engineering colleges in their replies with regard to the availability of Internet facility in their libraries. It is evident from the Chi square value which is not significant at 0.05 level with 1 degree of freedom.

Table 2 also shows that there is no significant difference between men and women faculty members in their replies with regard to the availability of Internet facility in the libraries. Chi square value is not significant at 0.05 level with 1 degree of freedom. There is also no significant difference between the faculty members who obtained low professional involvement score and those who obtained high professional involvement score in this regard. It is tested by Chi square value which is not significant at 0.05 level with 1 degree of freedom.

Table 2 also shows that there are no significant differences between low age group and middle age group faculty members on the one hand, and middle age and high age group faculty members on the other hand in this regard. There is also no significant difference between low age and high age group faculty members in this regard. Chi square values are not significant at 0.05 level with 1 degree of freedom. It can be concluded that on the whole there is no significant association between the age of faculty members and their replies with regard to the availability of Internet facility in their libraries as tested by Chi square value which is not significant at 0.05 level with 2 degrees of freedom.

Table 2: Distribution of faculty members according to their responses with regard to Internet facility in their libraries

Reply	Age group			Gender		Qualifications			Designation		Professional Involvement Group		Total
	22 - 30 Low	31 – 40 Middle	> 40 High	Men	Women	B. Tech	M. Tech	Ph.D	Junior	Senior	Low	High	
Yes	586 (95.6)	407 (95.1)	83 (93.3)	759 (95.5)	317 (94.6)	99 (99.0)	854 (95.1)	123 (93.2)	838 (95.6)	238 (94.1)	638 (95.1)	438 (94.2)	1076 (95.2)
No	27 (04.4)	21 (04.9)	6 (06.7)	36 (45.3)	18 (05.4)	1 (01.0)	44 (04.9)	9 (06.8)	39 (04.4)	15 (05.9)	27 (04.1)	27 (05.8)	54 (04.8)
Total	613	428	89	795	335	100	898	132	877	253	665	465	1130

Note: Figures in parentheses denote percentages.

Dependent	Variables	Chi Square	df	p Value	Table Value	Observation at 0.05 level
	Independent	(X ²) Value				
Internet facility	Age	0.958	2	0.620	5.991	Not Significant
	<i>Low – Middle</i>	0.144	1	0.704	3.841	Not Significant
	<i>Low – High</i>	0.947	1	0.330	3.841	Not Significant
	<i>Middle – High</i>	0.501	1	0.479	3.841	Not Significant
	Gender	0.370	1	0.543	3.841	Not Significant
	Qualifications	4.373	2	0.112	5.991	Not Significant
	<i>B. Tech – M. Tech</i>	3.178	1	0.075	3.841	Not Significant
	<i>B. Tech – Ph.D.</i>	4.670	1	0.031	3.841	Significant
	<i>M. Tech – Ph.D.</i>	0.868	1	0.352	3.841	Not Significant
	Designation	0.948	1	0.330	3.841	Not Significant
	Professional involvement	1.834	1	0.176	3.841	Not Significant

On the whole, there is no significant difference among the faculty members with various educational levels in their replies with regard to the availability of Internet facility in their libraries. It is evidenced by Chi square value which is not significant at 0.05 level with 2 degrees of freedom. There is no significant difference between B.Tech and M.Tech faculty members on the one hand, and M.Tech and Ph.D faculty members on the other hand in this regard. It is tested by Chi square values which are not significant at 0.05 level with 1 degree of freedom. However, there is a significant difference between B.Tech and Ph.D faculty members in this regard. The chi square value is significant at 0.05 level with 1 degree of freedom. That means more number of B.Tech faculty members replied that Internet facility is available in their libraries compared to Ph.D faculty members.

5.3 Utilization of Internet facility

The faculty members, who replied that Internet facility is available in their library, were again questioned about the utilization of Internet facility for their academic work in the library. The responses made by them are shown in Table 3.

It is evident from Table 3, most of the faculty members (94.9%) replied that they utilize the Internet facility from their libraries and the remaining 5.1% of them replied negatively in this regard. The table also shows that there is no significant difference between junior and senior faculty members of engineering colleges with regard to utilizing the Internet facility from their libraries. It is evident from the Chi square value which is not significant at 0.05 level with 1 degree of freedom.

Table 3 also shows that there is no significant difference between men and women faculty members with regard to utilizing the Internet facility from their library. Chi square value is significant at 0.05 level with 1 degree of freedom. There is also no significant difference between faculty members who obtained low professional involvement score and those who obtained high professional involvement score. It is tested by Chi square value which is not significant at 0.05 level with 1 degree of freedom.

Table 3: Distribution of faculty members according to their responses with regard to utilization of Internet facility

Reply	Age group			Gender		Qualifications			Designation		Professional Involvement Group		Total
	22 – 30 Low	31 – 40 Middle	> 40 High	Men	Women	B. Tech	M. Tech	Ph.D	Junior	Senior	Low	High	
Yes	554 (94.5)	388 (95.3)	79 (95.2)	721 (95.0)	300 (94.6)	91 (91.0)	820 (96.0)	110 (89.4)	795 (94.9)	226 (95.0)	603 (94.5)	418 (95.4)	1021 (94.9)
No	32 (05.5)	19 (04.7)	4 (04.8)	38 (05.0)	17 (05.3)	8 (08.0)	34 (04.0)	13 (10.6)	43 (05.1)	12 (05.0)	35 (05.5)	20 (04.6)	55 (05.1)
Total	586	407	83	759	317	99	854	123	838	238	638	438	1076

Note: Figures in parentheses denote percentages.

Dependent	Variables		Chi Square (X ²) Value	df	p Value	Table Value	Observation at 0.05 level
	Independent						
Utilization of Internet facility	Age		0.327	2	0.849	5.991	Not Significant
	<i>Low – Middle</i>		0.310	1	0.578	3.841	Not Significant
	<i>Low – High</i>		0.059	1	0.808	3.841	Not Significant
	<i>Middle – High</i>		0.004	1	0.953	3.841	Not Significant
	Gender		0.058	1	0.809	3.841	Not Significant
	Qualifications		11.602	2	0.003	5.991	Significant
	<i>B. Tech – M. Tech</i>		3.539	1	0.060	3.841	Not Significant
	<i>B. Tech – Ph.D.</i>		0.397	1	0.529	3.841	Not Significant
	<i>M. Tech – Ph.D.</i>		10.190	1	0.001	3.841	Significant
	Designation		0.003	1	0.956	3.841	Not Significant
	Professional involvement		0.453	1	0.501	3.841	Not Significant

Table 3 also shows that there is no significant difference among the various age groups of faculty members with regard to utilizing the Internet facility from their libraries. It is tested by chi square value which is not significant at 0.05 level with 2 degrees of freedom. There is no significant difference between low age group and middle age group faculty members. There are also no significant differences between middle age and high age group faculty members on the one hand, and low age group and high age group faculty members on the other hand in this regard. Chi square values are not significant of 0.05 level with 1 degree of freedom. It can be concluded that on the whole there is no significant association between the age of faculty members and their utilization of Internet facility from their libraries.

On the whole, there is a significant difference among the faculty members with various educational levels with regard to utilization of Internet facility from their respective libraries. It is evidenced by Chi square value which is significant at 0.05 level with 2 degrees of freedom. There are no significant differences between B.Tech and M.Tech faculty members on the one hand, and B.Tech and Ph.D faculty members on the other hand in this regard. Chi square values are not significant at 0.05 level with 1 degree of freedom. There is a significant difference between M.Tech and Ph.D faculty members in this regard. More number of M.Tech faculty members utilize Internet facility compared to Ph.D faculty members. On the whole, there is a significant association between the educational level of faculty members and the utilization of Internet facility from their respective libraries.

5.4 Purpose of using Internet

The Internet provides a wealth of information on any subject field. Faculty and students are using the Internet increasingly and it occupies an important place in study and research. It is widely used by the academic community for educational and research purposes. The dependency on the Internet and its service is increasing day-by-day and the users of engineering colleges too are depending more and more on the Internet for their various educational information needs. A question has been put to faculty members who are utilizing the Internet facility, to know the purpose of using Internet. The replies given by them are shown in Table 4.

Table 4: Distribution of faculty members according to their responses with regard to the purpose of using Internet

S. No.	Purpose of using Internet	Faculty members (N = 1021)	
		No.	%
1	Teaching	973	95.3
2	Research	596	58.4
3	Communication	403	39.6

Note: Respondents were permitted to tick more than one answer.

It is evident from Table 4 that most of the faculty members (95.3%) are using Internet for teaching purpose, followed by research purpose (58.4%) and communication purpose (39.6%). A study conducted by Vijay kumar (20) reveals that majority of the faculty members are using Internet for communication (86.9%) subject information (71.3%) and research (52.5%).

5.5 Frequency of Internet use

A question has been posed to the faculty members, who replied that they are utilizing the Internet, to know the frequency of using it. The responses made by them are shown in Table 5.

It is evident from Table 5 that majority of the faculty members (73.1%) use Internet daily, followed by thrice a week (14.2%), twice a week (6.5%) and once in a week (5.3%). The table also shows that there is a significant difference between junior and senior faculty members of engineering colleges in the frequency of using Internet. It is evident from Chi square value which is significant at 0.05 level with 3 degrees of freedom. It means that senior faculty members are using Internet more compared to junior faculty members.

Table 5: Distribution of faculty members according to their responses with regard to the frequency of using internet

Frequency	Age group			Gender		Qualifications			Designation		Professional Involvement Group		Total
	22 – 30 Low	31 – 40 Middle	> 40 High	Men	Women	B. Tech	M. Tech	Ph.D	Junior	Senior	Low	High	
Daily	375 (67.7)	309 (79.6)	62 (78.5)	541 (75.0)	205 (68.3)	49 (53.8)	611 (74.5)	86 (78.2)	564 (70.9)	182 (80.5)	423 (70.1)	323 (77.3)	746 (73.1)
Thrice a week	89 (16.1)	49 (12.6)	7 (8.9)	98 (13.6)	47 (15.7)	16 (17.6)	112 (13.7)	17 (15.5)	122 (15.3)	23 (10.2)	94 (15.6)	51 (12.2)	145 (14.2)
Twice a week	50 (09.0)	16 (04.1)	10 (12.7)	49 (06.8)	27 (09.0)	15 (16.5)	55 (06.7)	6 (05.5)	58 (07.3)	18 (08.0)	49 (08.1)	27 (06.5)	76 (07.4)
Once in a week	40 (07.2)	14 (03.6)	0 (0)	33 (04.6)	21 (07.0)	11 (12.1)	42 (05.1)	1 (0.9)	51 (06.4)	3 (01.3)	37 (06.1)	17 (04.1)	54 (05.3)
Total	554	388	79	721	300	91	820	110	795	226	603	418	1021

Note: Figures in parentheses denote percentages.

Dependent	Variables		Chi Square (X ²) Value	df	p Value	Table Value	Observation at 0.05 level
	Independent						
Frequency of using Internet	Age		29.070	6	0.000	12.592	Significant
	Low – Middle		19.344	3	0.000	7.815	Significant
	Low – High		10.199	3	0.017	7.815	Significant
	Middle – High		12.226	3	0.007	7.815	Significant
	Gender		5.678	3	0.128	7.815	Not Significant
	Qualifications		29.412	6	0.000	12.592	Significant
	B. Tech – M. Tech		22.746	3	0.000	7.815	Significant
	B. Tech – Ph.D.		20.751	3	0.000	7.815	Significant
	M. Tech – Ph.D.		4.355	3	0.226	7.815	Not Significant
	Designation		14.243	3	0.003	7.815	Significant
	Professional involvement		6.629	3	0.085	7.815	Not Significant

Table 5 also shows that there is no significant difference between men and women faculty members in the frequency of using Internet from the library. Chi square value is not significant at 0.05 level with 3 degrees of freedom. There is also no significant difference between faculty members who obtained low professional involvement score and those who obtained high professional involvement score. It is tested by Chi square value which is not significant at 0.05 level with 3 degrees of freedom.

Table 5 also shows that there is a significant difference among the various age groups of faculty members in the frequency of using Internet from their libraries. It is tested by Chi square value which is not significant at 0.05 level with 6 degrees of freedom. There is a significant difference between low age group and middle age group faculty members. There are also significant differences between middle age and high age group faculty members on the one hand, and low age group and high age group faculty members on the other hand. Chi square values are significant at 0.05 level with 3 degrees of freedom. Middle age and high age group faculty members are using Internet more frequently compared to low age group faculty members. It can be concluded that there is a significant association between the age of faculty members and the frequency of using Internet from the library.

On the whole, there are significant differences among the faculty members with various educational levels in the frequency of using Internet from the library. It is evidenced by Chi square value which is significant at 0.05 level with 6 degrees of freedom. There are significant differences between B.Tech and M.Tech faculty members on the one hand and B.Tech and Ph.D faculty members on the other hand in using Internet. It is evidenced by Chi square values which are significant at 0.05 level with 3 degree of freedom. M.Tech and Ph.D faculty members are using Internet more frequently compared to B.Tech faculty members. There is no significant difference between M.Tech and Ph.D faculty members in this regard. It is evidenced by Chi square value which is not significant at 0.05 level with 3 degrees of freedom. Finally, it can be concluded that there is significant association between the educational level of faculty members and their frequency of using Internet.

5.6 Reasons for not utilizing Internet facility

The faculty members, who are not utilising Internet facility of their libraries, were asked to mention the reasons for not utilising the same. The responses made by them are shown in Table 6.

Table 6: Reasons for not using Internet

S. No.	Reasons	Faculty members (N = 55)	
		No.	%
1	Insufficient number of computer systems	55	100.0
2	Low speed of Internet	06	10.9
3	Frequent power failures	06	10.9

Note: Respondents were permitted to tick more than one answer.

All the faculty members replied that (100%) insufficient number of computer systems is the reason for not utilising the Internet facility of their libraries. In addition to this reason, a few faculty members specified that low speed of Internet (10.9%) and frequent power failures (10.9%) are the other reasons for not utilising the Internet facility of their libraries.

5.7 Convenient place for using Internet

A question has been posed to the faculty members to know the convenient place for using Internet. The responses made by them are shown in Table 7.

Table 7: Distribution of faculty members according to their responses with regard to the convenient place for using Internet

S. No	Place	Faculty members (N = 1130)	
		No.	%
1	Department	786	69.6
2	Library	446	39.5
3	Browsing Centre	92	08.1
4	Home	260	23.0

It is evident from Table 7 that majority of the faculty members (69.6%) opined that the ‘Department’ is the most convenient place for Internet browsing, followed by ‘Library’ (39.5%), ‘Home’ (23%) and ‘Browsing centre’ (8.1%).

5.8. OPAC (Online Public Access Catalogue) facility

The introduction of information and communication technology has changed the way libraries access, store, retrieve and disseminate information. OPAC is one of these technologies to provide access to any of the information available in the library. It allows users to search a document by author, title, subject and key words sitting in their respective departments and also allows printing, downloading or exporting records via different electronic means. Users can find out the status of a document in the library collection, can reserve and renew a document of their interest. A question has been posed to the faculty members to know the provision of OPAC facility in the library. The responses made by them are shown in Table 8.

Table 8: Provision of OPAC in Engineering college libraries

S. No.	Response	Faculty members	
		No.	%
1	Yes	782	69.2
2	No	348	30.8
	Total	1130	100.00

It is evident from Table 8 that majority of the faculty members (69.2%) replied that their libraries are providing OPAC facility and the remaining of them (30.8%) replied negatively in this regard.

5.9. Satisfaction with the CD-ROM search facility

The libraries are purchasing CD-ROM databases on different subjects. CD-ROM databases should be made available for the use of readers. The computer facility is to be provided in the library for the users to make use of CD-ROM databases. A question has been posed to the faculty members to know their satisfaction with CD-ROM search facility provided by their libraries. The responses made by them are shown in Table 9.

It is evident from Table 5.69 that majority of the faculty members (47.6%) are satisfied with the CD-ROM search facility provided by their respective libraries, 35.5% of them are dissatisfied and 16.9% of them are neither satisfied nor dissatisfied in this regard.

Table 9: Satisfaction with CD-ROM search facility

S. No.	Satisfaction	Faculty members	
		No.	%
1	Satisfied	538	47.6
2	Neither satisfied nor dissatisfied	191	16.9
3.	Dissatisfied	401	35.5
	Total	1130	100.00

5.10. Digital library

Digital libraries are electronic libraries in which large number of geographically distributed users can access the contents of large and diverse depositories of electronic objects. Electronic objects include networked text, images, maps, sounds and videos. They also include hypertext and hypermedia and multimedia compositions. A question has been posed to the faculty members to know whether a separate digital library is available in their library. The responses made by them are shown in Table 10.

It is evident from Table 10 that most of the faculty members (78%) replied that digital library is available in their libraries concerned and the remaining of them (22%) replied negatively in this regard. The table also shows that there is a significant difference between junior and senior faculty members of engineering colleges in their replies with regard to the availability of digital library. It is evident from the Chi square value which is significant at 0.05 level with 1 degree of freedom. It means that more number of senior faculty members replied that their libraries have digital library compared to junior faculty members.

Table 10 also shows that there is no significant difference between men and women faculty members in their replies with regard to the availability of digital library in their libraries. Chi square value is not significant at 0.05 level with 1 degree

of freedom. There is also a significant difference between faculty members who obtained low professional involvement score and those who obtained high professional involvement score in this regard. It is tested by Chi square value which is significant at 0.05 level with 1 degree of freedom. More number of the faculty members, who obtained high professional involvement score, replied that their libraries have digital library compared to those faculty members who obtained low professional involvement score.

Table 10 also shows that there is a significant difference among the various age groups of faculty members in their replies with regard to the availability of digital library in their libraries. It is tested by Chi square value which is significant at 0.05 level with 2 degrees of freedom. There is a significant difference between low age group and middle age group faculty members on the one hand, and low age and high age group faculty members on the other hand in this regard. Chi square values are significant at 0.05 level with 1 degree of freedom. More number of middle age and high age group faculty members replied that their libraries have digital libraries compared to low age group faculty members

There is no significant difference between middle age and high age group faculty members in this regard. It is tested by Chi square value which is not significant at 0.05 level with 1 degree of freedom. It can be concluded that there is a significant association between the age of faculty members and their replies with regard to the availability of digital library in their respective libraries.

Table 10: Distribution of faculty members according to their responses with regard to the availability of digital library in their library

Reply	Age group			Gender		Qualifications			Designation		Professional Involvement Group		Total
	22 – 30 Low	31 – 40 Middle	> 40 High	Men	Women	B. Tech	M. Tech	Ph.D	Junior	Senior	Low	High	
Yes	450 (73.4)	353 (82.5)	78 (87.6)	626 (78.7)	255 (76.1)	77 (77.0)	688 (76.6)	116 (87.9)	665 (75.8)	216 (85.4)	497 (74.7)	384 (82.6)	881 (78.0)
No	163 (26.6)	75 (17.5)	11 (12.4)	169 (21.3)	80 (23.9)	23 (23.0)	210 (23.4)	16 (12.1)	212 (24.2)	37 (14.6)	168 (25.3)	81 (17.4)	249 (22.0)
Total	613	428	89	795	335	100	898	132	877	253	665	465	1130

Note: Figures in parentheses denote percentages.

Dependent	Variables	Chi Square	df	p Value	Table Value	Observation at 0.05 level
	Independent	(X ²) Value				
Availability of Digital Library	Age	17.326	2	0.000	5.991	Significant
	<i>Low – Middle</i>	11.749	1	0.001	3.841	Significant
	<i>Low – High</i>	8.443	1	0.004	3.841	Significant
	<i>Middle – High</i>	1.417	1	0.234	3.841	Not Significant
	Gender	0.944	1	0.331	3.841	Not Significant
	Qualifications	8.559	2	0.014	5.991	Significant
	<i>B. Tech – M. Tech</i>	0.007	1	0.931	3.841	Not Significant
	<i>B. Tech – Ph.D.</i>	4.815	1	0.028	3.841	Significant
	<i>M. Tech – Ph.D.</i>	8.528	1	0.004	3.841	Significant
	Designation	10.421	1	0.001	3.841	Significant
	Professional involvement	9.800	1	0.002	3.841	Significant

On the whole, there are significant differences among the faculty members with various educational levels in their replies with regard to the availability of digital library in their libraries. It is evidenced from Chi square value which is significant at 0.05 level with 2 degrees of freedom. There is no significant difference between B.Tech and M.Tech faculty members in this regard. It is evidenced from the Chi square value which is not significant at 0.05 level with 1 degree of freedom. There are significant differences between B.Tech and Ph.D faculty members on the one hand, M.Tech and Ph.D faculty members on the other hand in this regard. It is evidenced from the Chi square values which are significant at 0.05 level with 1 degree of freedom. That means more number of Ph.D faculty members replied that their libraries have digital libraries compared to B.Tech and M.Tech faculty members. On the whole, it can be concluded that there is a significant association between educational level of faculty members and their replies with regard to the availability of digital library in their respective libraries.

5.11. Provision of printing facility

Again a question has been posed to the faculty members who replied that their libraries possess digital libraries to know the provision of printing facility in their digital library. The responses made by them are shown in Table 11.

It is evident from Table 11 that majority of the faculty members (56.2%) replied that printing facility is available in their digital library and the remaining 43.8% of them replied negatively in this regard. The table also shows that there is a significant difference between junior and senior faculty members of engineering colleges with regard to the availability of printing facility in their digital library. It is evident from the Chi square value which is significant at 0.05 level with 1 degree of freedom. It means that more number of senior faculty members replied that printing facility is available in their digital library compared to junior faculty members.

Table 11 also shows that there is no significant difference between men and women faculty members with regard to printing facility available in their digital library. Chi square value is not significant at 0.05 level with 1 degree of freedom. But there is a significant difference between faculty members who obtained low professional involvement score and those who obtained high professional involvement score. It is tested by Chi square value which is significant at 0.05 level

with 1 degree of freedom. More number of faculty members, who obtained low professional involvement score, replied that printing facility is not available in their digital library compared to those faculty members who obtained high professional involvement score.

Table 11 also shows that on the whole there is no significant difference among the various age groups of faculty members with regard to availability of printing facility in their digital library. It is tested by Chi square value which is not significant at 0.05 level with 2 degrees of freedom. There is a significant difference between low age group and high age group faculty members in this regard. It is tested by Chi square value which is significant at 0.05 level with 1 degree of freedom. That means more number of high age group faculty members replied that the printing facility is available in their digital library compared to low age group faculty members. There are no significant differences between middle age and high age group faculty members on the one hand and low age group and middle age group faculty members on the other hand in this regard. Chi square values are not significant at 0.05 level with 1 degree of freedom. On the whole, there is no significant association between the age of faculty members and their replies with regard to availability of printing facility.

On the whole, there is a significant difference among the faculty members with various educational levels with regard to availability of printing facility in their digital library. It is evidenced from the Chi square value which is significant at 0.05 level with 2 degrees of freedom. There is no significant difference between B.Tech and M.Tech faculty members in this regard. It is evidenced from the Chi square value which is not significant at 0.05 level with 1 degree of freedom. There are significant differences between B.Tech and Ph.D faculty members on the one hand, and M.Tech and Ph.D faculty members on the other hand. It is evidenced from the Chi square values which are significant at 0.05 level with 1 degree of freedom. More number of Ph.D faculty members replied that printing facility is available in their digital library compared to B.Tech and M.Tech faculty members. On the whole, it can be concluded that there is a significant association between the educational level of faculty members and their replies with regard to the provision of printing facility in their digital library.

Table 11 :Distribution of faculty members according to their responses with regard to the printing facility in their digital library

Reply	Age group			Gender		Qualifications			Designation		Professional Involvement Group		Total
	22 – 30 Low	31 – 40 Middle	> 40 High	Men	Women	B. Tech	M. Tech	Ph.D	Junior	Senior	Low	High	
Yes	238 (52.9)	206 (58.4)	51 (65.4)	341 (54.5)	154 (60.4)	41 (53.2)	373 (54.2)	81 (69.8)	357 (53.7)	138 (63.9)	257 (51.7)	238 (62.0)	495 (56.2)
No	212 (47.1)	147 (41.6)	27 (34.6)	285 (45.5)	101 (39.6)	36 (46.8)	315 (45.8)	35 (30.2)	308 (46.3)	78 (36.1)	240 (48.3)	146 (38.0)	386 (43.8)
Total	450	353	78	626	255	77	688	116	665	216	497	384	881

Note: Figures in parentheses denote percentages.

Variables		Chi Square	df	p Value	Table Value	Observation at 0.05 level
Dependent	Independent	(X ²) Value				
Printing facility	Age	5.344	2	0.069	5.991	Not Significant
	<i>Low – Middle</i>	2.393	1	0.122	3.841	Not Significant
	<i>Low – High</i>	4.190	1	0.041	3.841	Significant
	<i>Middle – High</i>	1.311	1	0.252	3.841	Not Significant
	Gender	2.579	1	0.108	3.841	Not Significant
	Qualifications	10.125	2	0.006	5.991	Significant
	<i>B. Tech – M. Tech</i>	0.026	1	0.872	3.841	Not Significant
	<i>B. Tech – Ph.D.</i>	5.471	1	0.0193	3.841	Significant
	<i>M. Tech – Ph.D.</i>	9.843	1	0.002	3.841	Significant
	Designation	6.897	1	0.009	3.841	Significant
Professional involvement	9.279	1	0.002	3.841	Significant	

5.12. Cost collected for printing

A question has been posed to the faculty members, who replied that printing facility is available in their digital library, to know the cost collected for printing in their digital library. The responses made by them are shown in Table 11.

Table 12: Distribution of faculty members according to their responses with regard to the cost collected for printing

S. No	Amount	Faculty members	
		No.	%
1	Free	49	09.7
2	0.50	27	05.4
3	1.00	383	76.0
4	2.00	45	08.9
	Total	504	100.00

It is evident from Table 12 that most of the faculty members (76%) opined that the cost collected for printing is Rs.1/- per page. It is also evident from the table that 9.7% of them replied that no charges are collected for printing; 8.9% of them replied that the cost collected for printing is Rs. 2/- per page; and 5.4% of them replied that the cost collected for printing is 50 paise per page.

5.13 Courseware

A question has been posed to the faculty members to know the courseware provided by their libraries. The responses made by them are shown in Table 13.

Table 13: Distribution of faculty members according to their responses with regard to the coursewares provided by their libraries

S. No.	Courseware	Faculty members				Total
		Reply				
		Yes		No		
		No.	%	No.	%	
1	NPTEL	951	84.2	179	15.8	1130
2	MIT	364	32.2	766	67.8	1130

It is evident from Table 13 that most of the faculty members (84.2%) replied that the access to NPTEL courseware is provided in their libraries and the remaining 15.8% of them replied negatively in this regard. It is also evident from the table that majority of the faculty members (67.8%) replied that the access to MIT open courseware is not provided in their libraries and the remaining of 32.2% of them replied negatively in this regard.

6. Findings

1. Most of the faculty members (96.8%) replied that their libraries use computers for automation of house keeping operations. There are no significant differences among the various groups of faculty members in their replies with regard to using of computers for automation of house keeping operations of their libraries.
2. Most of the faculty members (95.2%) replied that Internet facility is available in their libraries. There are no significant differences with regard to the availability of Internet facility in their libraries among the various groups of faculty members.
3. Most of the faculty members (94.9%) are utilizing the Internet facility from the library. There are no significant differences between junior and senior, men and women, low and high professional involvement groups and among the various age groups of faculty members of engineering colleges with regard to utilization of the Internet facility from the library. On the whole, there is a significant difference among the faculty members with various educational levels with regard to utilization of Internet facility from the library.
4. Among the faculty members, who are utilizing Internet facility, most of the them (95.3%) use Internet for teaching purpose.
5. Majority of the faculty members (73.1%) use Internet daily. There are no significant differences between men and women faculty members on one hand and low and high professional involvement groups of faculty memers on the other hand in the frequency of using Internet from library. However, there are significant differences between junior and senior and among the various age

and educational level groups of faculty members in the frequency of using Internet from the library.

6. Majority of the faculty members (69.6%) replied that the department is the most convenient place for Internet browsing.
7. Majority of the faculty members (69.2%) replied that their libraries are providing OPAC facility.
8. Most of the faculty members (78%) replied that the digital library is available in their libraries concerned. There are significant differences among the various groups of faculty members in their replies with regard to the availability of digital library in their libraries except between men and women faculty members.
9. Majority of the faculty members (56.2%) replied that printing facility is available in their digital library. There are no significant differences between men and women and also among the various age groups of faculty members in their replies with regard to the availability of printing facility in their digital libraries. There are significant differences between junior and senior faculty members, low and high professional involvement groups and among the various educational levels of faculty members in their replies with regard to the availability of printing facility.
10. Most of the faculty members (84.2%) replied that the access to NPTEL courseware is provided in their digital library.
11. Majority of them (67.8%) replied that the access to MIT open courseware is not provided in their digital library.

7. Recommendations

1. A few percentage of faculty members (4.8%) replied that their libraries are not providing Internet facility. Hence, the authorities concerned should take necessary steps to introduce this facility in their libraries.
2. Over a fourth of faculty members (30.8%) replied that their libraries are not providing OPAC facility. Hence, the authorities of the college libraries should take necessary steps to provide OPAC facility.

3. According to AICTE norms, there shall be a digital library with multimedia facility in each engineering college library. Over a fifth of the faculty members (22%) replied that the digital library is not available in their libraries. Hence, the engineering college libraries which do not have digital libraries should establish these libraries for the benefit of their users and to fulfil the requirement of AICTE for accreditation of their colleges.
4. A high percentage of faculty members (43.8%) replied that their digital libraries do not have printing facility. Hence, the authorities of the college libraries should take necessary measures to provide printing facility.
5. NPTEL provides e-learning through online web and video courses in engineering, science and humanities stream. The mission of NPTEL is to enhance the quality of engineering education in the country by providing free online courseware. As per AICTE norms, every library shall have NPTEL courseware. The study also reveals that 15.8% of faculty members replied that access to NPTEL courseware is not provided in their libraries. Hence, the engineering college library authorities should take necessary steps to make provision for accessing NPTEL courseware by providing a link through their college website or library website.
6. Majority of the faculty members (67.8%) replied that access to MIT open courseware is not provided by their libraries. Hence, the authorities of college libraries should take necessary steps to provide access to MIT open courseware through their college websites.
7. INDEST (Indian National Digital Library in Engineering Sciences and Technology) consortium was set up in 2003 by the Ministry of Human Resources Development (MHRD), Government of India and later it has been merged into E-ShodhSindhu, which was set up by MHRD in 2015. E-ShodhSindhu is a merger of UGC-INFONET Digital Library Consortium, NLIST and INDEST-AICTE Consortium. At present the subscription of INDEST - AICTE is not compulsory as per AICTE norms. The subscription of e-journal packages by Engineering college libraries is essential as per AICTE norms. Hence, AICTE should conduct a feasibility study on making the subscription of INDEST – AICTE Consortium mandatory by Engineering college libraries instead of present subscription to e-journal packages. If

feasible, the subscription to e-journals of INDEST-AICTE is to be made compulsory by all engineering college libraries in Andhra Pradesh by AICTE.

8. Today engineering college libraries are unable to satisfy all the information requirements of their users from their own collection. Library networking is meant for promoting and facilitating sharing of resources available within a group of libraries with the purpose of providing information services optimally to all the potential users and also to make use of national and international resources.

Network of engineering college libraries in Andhra Pradesh envisages a wider accessibility of its resources, facilities and services to students, faculty, practitioners and researchers spread all over the state of Andhra Pradesh. Government of Andhra Pradesh with the advice from AICTE should design and establish a network of Engineering college libraries in Andhra Pradesh, which may be called Andhra Pradesh Engineering College Libraries Network (APECLIBNET).

It should be a computer communication network of engineering college libraries to improve the capability of resource sharing and information access of academic community in Andhra Pradesh. It should be a co-operative network and should contribute to pooling, sharing and optimization of resources, facilities and services of engineering college libraries in the state. It should also aim to develop a programme towards the modernization of engineering college libraries.

9. Conclusion

As Engineering College libraries play a vital role in providing quality education to the students of Engineering colleges, their ICT facilities are to be improved to meet the information requirements of their users namely students, research scholars and faculty members by conducting user surveys at least once in a year and getting feedback from them.

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