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Electronic Resources Access Pattern in Engineering College Libraries: An Analytical Study at Vellore District, Tamil Nadu

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Abstract **- This study conducted to find out the electronic information/resources access and seeking behavior of engineering college students in Vellore district. Objective- of the paper is to identify the availability of e-resources, awareness, usage level, level of satisfaction and barriers during access of the students. Methodology-a systematic questionnaire designed and distributed among the Engineering College library users. After data collection analysis of the study done. Findings - It is observed from the data analysis most of the UG Students are using Google as their search engine and they prefer DELNET also on the other hand PG students and faculty prefer all subscribed resources for their teaching and learning. There is a less awareness about the commercial resources among the students. Suggestions were given to improve the infrastructure and need orientation programme for all category of users.**
Keywords: **Electronic Resources, Educational Institutions, Communication Technology**

I. INTRODUCTION

Higher Educational institutions are playing key role in disseminating electronic information to the users of the libraries. Information seeking behavior differs among user groups. Academic libraries must understand the information needs of the students and faculty. In order to full fill their needs the administrator of the institutions and librarians should bring the latest technological development viz. Digital information/electronic-resources for quick dissemination of information resources to the users. Due to information and communication Technology every day latest e-resources marketing in the field of higher education. The electronic resources should be upgraded or subscribed for the sake of Teaching and learning purpose. The Government of India and Ministry of HRD taking initiatives for growth and development of electronic resources. The Government provides subsidy for certain category of institutions regarding subscription of electronic resources. There are difference types of electronic resources viz. Delnet, Inflibnet, Proquest, Scopus, Springer, Science Direct.

II. REVIEW OF LITERATURE

Srilakshmi, B and Sridhar, K (2018) investigate the access and use of e-resources by the faculty members and students in university of madras, the study is a quantities approach using questionnaire to gather the data and information from total respondents of 120. The study recommends that the establishment of basic arrangement that support the effective use of online resources acquire by the library are put into maximal use by the library patrons thereby ensuring the accomplishments of the libraries unbiased which is satisfying the users information needs. Raja, I *et al.,* (2018) investigated the infrastructure and Internet facilities for Faculty members to access online resources with special reference to Engineering Colleges in Thanjavur District, Tamil Nadu. Total no of questionnaires 110 are distributed among faculty members of engineering colleges in Thanjavur to collect relevant data. 96% (110) Faculty members have responded where 106 responses are collected to the Library Internet/Browsing centre during working hours. Majority (58%) of the Engineering college library internet centre during working hours are from 8am to 4pm. For 100% availability of internet browsing facility in the institutions for members of the faculty and the researchers, 100% institutions for internet centre are maintaining log book and provide user statistics in the internet centre/library. Internet bandwidth (45%) of institution has 2 MBPS bandwidth to meet the needs of the faculty. Online resources are playing a vital role to meet future demands of faculty members and research scholars for information and knowledge.

III. OBJECTIVES OF THE STUDY

The following are the important objectives of the study,

1. To study the availability of electronic information resources in the concerned colleges
2. To study the impact of electronic resources among the academic users
3. To identify the awareness about the Open Source resources
4. To know the different category of users and their preference of resources
5. To find out the problems faced by the users while using electronic resources.
6. To measure the users- level of satisfaction on electronic resources
7. To investigate the man power support to access electronic resources
8. To indentify the infrastructure facility of the colleges under study
9. To know the latest technological development in libraries

IV. RESEARCH DESIGN

The present research work is a case study of the academic community of engineering colleges in Vellore district of Tamil Nadu, India. A systematic questionnaire designed to collect data from the engineering college library users. There is 1500 Questionnaire distributed to concerned college library users. There are 1290 questionnaire are received back that is response rate is 86%. After received the questionnaire they are edited and fed into computer MS-Excel for further analysis.

A. Sampling Plan: There are more than 20 Engineering colleges in Vellore District affiliated to Anna University, Tamil Nadu among the 20 Engineering colleges 15 are randomly selected for data collection and Geographical area of study also taken in to account.

V. DATA ANALYSIS & DISCUSSIONS

TABLE I NAME OF THE ENGINEERING COLLEGES IN VELLORE DISTRICT UNDER STUDY

S. No.	Name of the Institution	No. of Questionnaire distributed	No. of Questionnaire Received back	Percentage
1	Adhiparasakthi College of Engineering , Kalavai	100	92	92%
2	Annai Mira College of Engineering and Technology, Arappakkam	100	86	86%
3	Bharathidasan Engineering College, Natramballi	100	75	75%
4	C. Abdul Hakeem College of Engineering & Technology , Melvisharam	100	87	87%
5	Ganadipathy Tulsi's Jain Engineering College, Kaniyambadi	100	69	69%
6	Global Institute of Engineering and Technology, Melvisharam	100	70	70%
7	Kingston Engineering College, Katpadi	100	78	78%
8	Podhigai College of Engineering and Technology, Tirupattur	100	86	86%
9	Priyadarshini Engineering College, Vaniyambadi	100	80	80%
10	Ranipettai Engineering College, Walajapet	100	91	91%
11	Saraswathi Velu College of Engineering, Sholinghur	100	88	88%
12	Shri Sapthagiri Institute of Technology, Nemili	100	73	73%
13	Sree Krishna College of Engineering, Anaikattu	100	76	76%
14	Sri Nandhanam College of Engineering & Technology, Tirupattur	100	75	75%
15	Thanthai Periyar Government institute of Technology, Thorapadi	100	74	74%
	TOTAL	1500	1200	80%

The above table I depicts the data collection study of the Engineering colleges in Vellore district. According to the table highlights the Adhiparasakthi College of Engineering, Priyadarshini Engineering College and Ranipettai Engg. College respondents' rate is more than 90% and rest of the colleges 80% and above filled the questionnaire. Over all response rate is 86%.

TABLE II NAME OF THE SUBJECT DISCIPLINE VS DESIGNATION

Name of the discipline	Designation				Total
	Students	Asst. Professor	Associate Professor	Professor	
B.E Mechanical Engineering	127	21	8	11	167
	18.7%	11.4%	3.7%	9.2%	13.9%
B. Tec. Information Technology	42	9	17	8	76
	6.2%	4.9%	7.8%	6.7%	6.3%
B.E Civil Engineering	19	25	29	10	83
	2.8%	13.6%	13.4%	8.3%	6.9%
B.E Computer Science and Engineering	37	8	15	10	70
	5.4%	4.3%	6.9%	8.3%	5.8%
B.E Electrical and Electronic Engineering	50	2	19	8	79
	7.4%	1.1%	8.8%	6.7%	6.6%
B. Tech. Biotechnology	33	21	18	10	82
	4.9%	11.4%	8.3%	8.3%	6.8%

B.E Electronic and Inst. Engineering	59	9	6	4	78
	8.7%	4.9%	2.8%	3.3%	6.5%
B.E Electronic and com. engineering	20	18	14	3	55
	2.9%	9.8%	6.5%	2.5%	4.6%
B.E Aeronautical Engineering	73	1	0	4	78
	10.8%	.5%	0.0%	3.3%	6.5%
M. Tech Bio technology	57	0	2	1	60
	8.4%	0.0%	.9%	.8%	5.0%
M.E. Computer science and Engineering	24	5	5	8	42
	3.5%	2.7%	2.3%	6.7%	3.5%
M.E. Mechatronics	21	24	11	8	64
	3.1%	13.0%	5.1%	6.7%	5.3%
M.E Power Electronics and Drives	16	2	22	11	51
	2.4%	1.1%	10.1%	9.2%	4.3%
M.E VLSI	42	14	39	13	108
	6.2%	7.6%	18.0%	10.8%	9.0%
MCA	14	11	3	4	32
	2.1%	6.0%	1.4%	3.3%	2.7%
MBA	45	14	9	7	75
	6.6%	7.6%	4.1%	5.8%	6.3%
Total	679	184	217	120	1200
	100.0%	100.0%	100.0%	100.0%	100.0%
Pearson Chi-Square	Value	df		Asymp. Sig. (2-sided)	
	313.456[a]	45		.000	

The table II exposes the two types of respondents that are under graduate and Post graduate. Among this maximum of B.E Mechanical engineering students 127(18.7%) are participated in the study. In case of PG 57 (8.4%) M Tech Bio technology students covered under the study. In case of Asst. Professors and Associate Professors 184 and 217 are responded respectively. On the other hand 120 of Professors are participated under the study.

TABLE III AWARENESS OF E-RESOURCES VS DESIGNATION

Awareness of E-resources	**Designation**				**Total**
	Students	**Asst. Professor**	**Associate Professor**	**Professor**	
Not at all aware	80	17	46	32	175
	11.8%	9.2%	21.2%	26.7%	14.6%
Slightly aware	86	48	38	26	198
	12.7%	26.1%	17.5%	21.7%	16.5%
Somewhat aware	51	34	24	10	119
	7.5%	18.5%	11.1%	8.3%	9.9%
Moderately aware	195	47	78	28	348
	28.7%	25.5%	35.9%	23.3%	29.0%
Extremely aware	267	38	31	24	360
	39.3%	20.7%	14.3%	20.0%	30.0%
Total	679	184	217	120	1200
	100.0%	100.0%	100.0%	100.0%	100.0%
Pearson Chi-Square	Value	df		Asymp. Sig. (2-sided)	
	114.916[a]	12		0.000	

According to awareness of Electronic resources among the respondents from table III, It is observed that designation wise maximum 267 (39.3%) students extremely aware the e-resources facility on the other hand only 14.6% that is 175 of the respondents not aware the availability of e-resources.

TABLE IV TIME TAKEN TO ACCESS OR DOWNLOADING OF E-RESOURCES VS DESIGNATION

Quantum of time taken to access or downloading e-resources	Designation				Total
	Students	Asst. Professor	Associate Professor	Professor	
Less than 10 min	150	31	34	14	229
	22.1%	16.8%	15.7%	11.7%	19.1%
10 to 20 min	126	35	54	34	249
	18.6%	19.0%	24.9%	28.3%	20.8%
20to 30 min	96	27	36	24	183
	14.1%	14.7%	16.6%	20.0%	15.3%
30 to 40 min	95	20	40	15	170
	14.0%	10.9%	18.4%	12.5%	14.2%
More than 1 hrs.	212	71	53	33	369
	31.2%	38.6%	24.4%	27.5%	30.8%
Total	679	184	217	120	1200
	100.0%	100.0%	100.0%	100.0%	100.0%
Pearson Chi-Square	Value	df	Asymp. Sig. (2-sided)		
	29.471[a]	12	0.003 Rejected		

As per the table IV indicates that time has taken to access downloading of electronic resources is 229 (19.1%) are insisted that less than 10 minutes. Next to this 369(30.8%) of respondents are pointed out that more than 1 hour taken for downloading the documents.

TABLE V ACCESS TO A COMPUTER WITH INTERNET CONNECTION VS DESIGNATION

Access to a computer with internet connection	Designation				Total
	Students	Asst. Professor	Associate Professor	Professor	
At library	124	15	18	3	160
	18.3%	8.2%	8.3%	2.5%	13.3%
At home	112	22	30	18	182
	16.5%	12.0%	13.8%	15.0%	15.2%
At department	151	54	75	31	311
	22.2%	29.3%	34.6%	25.8%	25.9%
At our campus	292	93	94	68	547
	43.0%	50.5%	43.3%	56.7%	45.6%
Total	679	184	217	120	1200
	100.0%	100.0%	100.0%	100.0%	100.0%
Pearson Chi-Square	Value	df	Asymp. Sig. (2-sided)		
	47.170[a]	9	0.000 Rejected		

TABLE VI TIME SPENT IN THE ELECTRONIC INFORMATION GATHERING ACTIVITIES IN THE LIBRARY VS

Time spent in the electronic information gathering activities in the library	Time spent up to 1 to 2hrs		Time spent up to 2to3hrs	Time spent up to 3to4 hrs.	Time spent up to 4to 5hrs	More than 5 hrs.	M	R
Searching journal/magazine	Frequency	57	130	328	294	391	3.6933	5
	Percent	4.8	10.8	27.3	24.5	32.6		
Searching for Books	Frequency	98	45	236	402	419	3.8325	1
	Percent	8.2	3.8	19.7	33.5	34.9		
Browsing e-Journals on Internet	Frequency	97	69	276	409	349	3.7033	4
	Percent	8.1	5.8	23.0	34.1	29.1		
Searching online databases	Frequency	80	50	266	507	297	3.7425	3
	Percent	6.7	4.2	22.2	42.3	24.8		
E-mail alerts, correspondence	Frequency	48	63	285	514	290	3.7792	2
	Percent	4.0	5.3	23.8	42.8	24.2		
Accessing e-books	Frequency	86	99	325	465	225	3.5367	6
	Percent	7.2	8.3	27.1	38.8	18.8		

According to table VI expose that the time is spent in the electronic information gathering activities among the users. There are 391 (32.6%) respondents are spending more than 5 hours for searching journal/magazines. Among the 1200 respondents 419 and 225 are more than 5 hours time taken for browsing e-journals and e-books. In case of searching online database 80% (6.7%) and browsing e-journals 97 (8.1%) are time taken 1 to 2 hours.

TABLE VII SUBSCRIBED ONLINE DATABASES

Subscribed Online Databases		Not available	Not Readily available	Available	Readily available	M	R
IEEE / IEL	Frequency	94	214	144	748	3.2883	5
	Percent	7.8	17.8	12.0	62.3		
ACM Digital Library	Frequency	76	258	133	733	3.2692	7
	Percent	6.3	21.5	11.1	61.1		
ASME	Frequency	102	170	162	766	3.3267	1
	Percent	8.5	14.2	13.5	63.8		
ASCE	Frequency	113	177	143	767	3.3033	3
	Percent	9.4	14.8	11.9	63.9		
Nature(Online Journal)	Frequency	76	255	113	756	3.2908	4
	Percent	6.3	21.3	9.4	63.0		
Springer (Online Journal)	Frequency	233	343	234	390	2.6508	13
	Percent	19.4	28.6	19.5	32.5		
Science Direct	Frequency	86	213	148	753	3.3067	2
	Percent	7.2	17.8	12.3	62.8		
EBSCO	Frequency	207	223	380	390	2.7942	12
	Percent	17.3	18.6	31.7	32.5		
SCOPUS	Frequency	199	221	390	390	2.8092	11
	Percent	16.6	18.4	32.5	32.5		
DELNET	Frequency	72	276	104	748	3.2733	6
	Percent	6.0	23.0	8.7	62.3		
INFLIBNET	Frequency	230	360	220	390	2.6417	14
	Percent	19.2	30.0	18.3	32.5		
PRO-QUEST	Frequency	74	276	104	746	3.2683	8
	Percent	6.2	23.0	8.7	62.2		
Emerald Publishing	Frequency	88	286	118	708	3.2050	9
	Percent	7.3	23.8	9.8	59.0		
Springer (E-Books)	Frequency	124	311	135	630	3.0592	10
	Percent	10.3	25.9	11.3	52.5		

The table VII shows that Subscribed Online Databases depicts that IEEE/IEL and DELNET subscription in the colleges 748(62.3%) are insisted that readily available in their institution. On the other hand ASME and ASCE subscription 766 and 767 are recorded readily available. In case of science direct and proquest subscriptions only 86 and 74 respondents opined that these resources not available in their libraries.

TABLE VIII DIFFICULTIES OF ACCESSING E-RESOURCES VS DESIGNATION

Difficulties of Accessing E-resources	Designation				Total
	Students	Asst. Professor	Associate Professor	Professor	
Unavailability of E-Resources	45	19	20	11	95
	6.6%	10.3%	9.2%	9.2%	7.9%
Lack of Awareness About The	126	19	19	21	185

Library E-Resources	18.6%	10.3%	8.8%	17.5%	15.4%
Technical Difficulties Like Power Failure, Internet Connection, Etc.	70	18	25	22	135
	10.3%	9.8%	11.5%	18.3%	11.3%
Not Taking Proper Assistance From The Library Staffs	65	16	22	9	112
	9.6%	8.7%	10.1%	7.5%	9.3%
Do Not know how to Use Online Catalogue	30	19	36	19	104
	4.4%	10.3%	16.6%	15.8%	8.7%
Lack of Facilities	76	15	14	6	111
	11.2%	8.2%	6.5%	5.0%	9.3%
Time Duration During The Search	50	9	10	6	75
	7.4%	4.9%	4.6%	5.0%	6.3%
Distance To The Library	37	7	16	7	67
	5.4%	3.8%	7.4%	5.8%	5.6%
Lack of Knowledge in Using the Library System	51	10	23	8	92
	7.5%	5.4%	10.6%	6.7%	7.7%
Some Information Materials Are Too Old	129	52	32	11	224
	19.0%	28.3%	14.7%	9.2%	18.7%
Total	679	184	217	120	1200
	100.0%	100.0%	100.0%	100.0%	100.0%
Pearson Chi-Square	Value		df	Asymp. Sig. (2-sided)	
	95.156[a]		27	0.000 Rejected	

According to table VIII Difficulties of Accessing E-resources 126 (18.6%) of students opined that Lack of awareness about the Library e-Resources, Next to this 76 (11.2%) of students insisted that lack of facilities provided in their libraries. In case of Associate professors 36(16.6%) of them pointed out do not know how to use online catalogue, next to this 22 (18.3%) of Professors recorded their opinion on technical Difficulties found during the access of e-resources Like Power Failure, Internet Connection, Etc.

TABLE IX UPDATE WITH ICT DEVELOPMENTS VS DESIGNATION

Update with ICT developments	**Designation**				**Total**
	Students	**Asst. Professor**	**Associate Professor**	**Professor**	
Internet	71	15	14	13	113
	10.5%	8.2%	6.5%	10.8%	9.4%
E-Mail	43	8	15	5	71
	6.3%	4.3%	6.9%	4.2%	5.9%
Facilities from other department	73	33	38	26	170
	10.8%	17.9%	17.6%	21.7%	14.2%
Workshops, seminars and conferences	157	25	22	16	220
	23.1%	13.6%	10.2%	13.3%	18.3%
In-service	78	12	20	3	113
	11.5%	6.5%	9.3%	2.5%	9.4%
Educational resource services	42	3	4	1	50
	6.2%	1.6%	1.9%	.8%	4.2%
Professional books/ journals	28	7	2	5	42
	4.1%	3.8%	.9%	4.2%	3.5%
News letters	32	4	4	1	41

	4.7%	2.2%	1.9%	.8%	3.4%
Research journals	25	9	6	3	43
	3.7%	4.9%	2.8%	2.5%	3.6%
Publisher catalogues	54	27	42	14	137
	8.0%	14.7%	19.4%	11.7%	11.4%
World Wide Web	34	5	25	11	75
	5.0%	2.7%	11.6%	9.2%	6.3%
ICT vendors	42	36	24	22	124
	6.2%	19.6%	11.1%	18.3%	10.3%
Total	679	184	216	120	1199
	100.0%	100.0%	100.0%	100.0%	100.0%
Pearson Chi-Square	Value		df	Asymp. Sig. (2-sided)	
	152.317[a]		33	0.000 Rejected	

The table IX depicts that 220 (18.3%) of the respondents are opined that they are insisted that workshop, seminars and conferences are required for to aware about the e-resources access. Next to this 113 (9.4%) of respondents are insisted to increase Internet speed, apart from that 43(3.6%) of them to increase research journals in their libraries.

VI. SUGGESTIONS

The following suggestions were given that to improve better usage of electronic resources

1. It is suggested that maximum No of respondents insisted that seminars , conferences to be conducted for user awareness programmers
2. Research journals to be increased in their libraries
3. Increase the computer systems and high bandwidth internet connection
4. UPS facility will be provided to avoid irregular power supply
5. Proper orientation to be given for library usage and internet access

VII. CONCLUSION

On the basis of analysis, it is observed that DELNET, IEEE resources plays vital role in Engineering colleges and their usage is satisfied apart from that ASCE and ASME journals usage almost satisfied by the respondents. There are other commercial resources science districts, proquest database to be subscribed in most of the colleges. In case of awareness about the electronic resources proper training and retrieval techniques to be given to the library users. The overall respondents of the study are satisfactory level. There are many open sources electronic information available for higher educational institutions. It should be utilized by the users on proper user awareness programmers to be conducted. On the other hand the private institutions and management may take initiative to increase infrastructure for the sake of the users is need of the hour.

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