

**GROUPING THE USERS BASED ON USE OF E-RESOURCES: AN EMPIRICAL STUDY****K. M. Santhi*, S. Gopalakrishnan*** Research Scholar, Library Science, SCSVMV University, Kanchipuram-631561
Assistant University Librarian (Retd.), MIT, Anna University, Chennai-600044**DOI: 10.5281/zenodo.59115****KEYWORDS:** Use of e-resources, Exploratory Factor Analysis, VIT University, Component analysis, Grouping of library users.**ABSTRACT**

Today the libraries have transformed into digital and virtual libraries. Traditional books, journals and magazines have changed into e-books, e-journals, and e-magazines. There has been a considerable increase in awareness among the users about the library e – resources and e-services. The respondents' opinions were obtained in regard to use of e-resources. Opinions on nearly 23 variables were obtained and factor analysis was used. Out of 575 questionnaires distributed 507 were responded and the response rate works out to 88.18%. Out of 507 respondents, 384 (75.74%) were from Vellore campus and the remaining 123 (24.26%) from Chennai campus. Further 267 (52.68%) belongs to faculty and 240 (47.32%) belongs to research scholars. Initially the reliability test was conducted to ensure the usability of the variables. The Cronbach alpha value works out 0.9348 which indicates that the 23 variables thus taken up for the study were holds good. Exploratory Factor Analysis converted the 23 items (questions) into 5 factors which further suggested names according to the nature of items included in the factors. Based on the component the respondents were grouped as Pessimist, Optimist, Environs, Prejudiced, and Futurist.

INTRODUCTION

Today the libraries have transformed into digital and virtual libraries. Traditional books, journals and magazines have changed into e-books, e-journals, and e-magazines. This has increased the global dissemination of information. Electronic resources are easily accessible in remote areas. Both faculty and researchers use the electronic resources and most readily adopt them since the e-resources are perceived as convenient, relevant, and time saving to their natural workflow.

Convenience of accessing articles any time from their desktop computer (Palmer and Sandler 2003¹; Woodward et al. 1997²; Rusch-Feja and Siebeky 1999³; Maughan 1999⁴; Tenner and Yang 1999⁵; Hiller 2002⁶; Nicolaidis 2001⁷; Chu 1998⁸; Bishop 1999⁹); ease of skimming and searching, the possibility of downloading or printing the desired document or segment, the currency of information, the speed of access, and the ability to send articles to their colleagues instantly (Palmer and Sandler 2003¹; Rusch-Feja and Siebeky 1999³; Sathé, Grady, and Giuse 2002¹⁰; Entlich et al. 1996¹¹; Chu 1998⁸) are the few advantages experienced by the users in the use of e-resources. In this study attempt has been made to identify the views on e-resources among the faculty and research scholars of a deemed university.

E-RESOURCES IN VIT

VIT library provides the following e-resources to the users.

- (i) Subscribed more than 760 national and international printed journals which also contain the journals published by IEEE & IET and as per the policy of the publisher the users are getting free access to the electronic version of the printed one.
- (ii) The subscribed e-resources are ASCE Journals, ASME Journals, ASTM Journals and Standards, IEL online (IEEE & IET), Science Direct, EBSCO Business Source Complete, EMERALD Management 200 Journals, SCIFINDER Scholar, SAE Technical Papers, Indian Standards Codes, British Standards Euro Codes, ACM, ProQuest ABI/Inform Complete, ProQuest Dissertation and



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Thesis (ETD), Springer link 1600+ Journals, Math SciNet, Nature Publishing Group Journals, Scopus (e–bibliographic database with 15,100 peer reviewed journals indexing and abstracts).

- (iii) Also subscribed Engineering Village - Referex subject collections e-books and ebrary e-book collections.

With the help of the e – journals, library is in a position to render the services to its users which they have not able to provide with its print journals.

REVIEW OF LITERATURE

Several studies on e- resources in general and its use among researchers and faculties in academic libraries in particular, have been undertaken. The extent of aware of making use and the problems faced research scholars of Banaras Hindu University (Shukla & Mishra, 2011)¹², University of Delhi (Ali & Nisha, 2011)¹³, University of Karachi (Ansari & Zuberi, 2010)¹⁴ are the few. Similarly among the faculties were studied by Satpathy & Rout (2010)¹⁵, Natarajan, K. & Others (2010)¹⁶.

Use of electronic resources in Shaanxi University of Science and Technology (Shuling,2007)¹⁷, Asheshi University, Ghana, (Dadzie, 2005)¹⁸, International Islamic University, Malaysia (Majid and Abazova, 1999)¹⁹, Indian Institute of Technology (IIT) library in Delhi, India (Ali, 2005)²⁰ were few studies among faculties and researchers indicated the extensive use of e-resources.

VIT UNIVERSITY

VIT University or VIT , formerly called Vellore Engineering College, is an Indian institute of higher education and a deemed university under Section 3 of the UGC Act. Founded in 1984, as Vellore Engineering College, by Mr. G. Viswanathan. It has campuses both at Vellore and Chennai, Tamil Nadu, India. VIT offers academic programs in Engineering, Technology, Applied Sciences, and Management. It offers 20 undergraduate programs, 34 postgraduate, four integrated MS courses and four doctoral programs. VIT has consolidated its disciplines into 10 Schools of Study with the addition of the VIT Law School at its Chennai campus. Research centres are part of the schools to encourage collaboration between the research and coursework areas and provide opportunity for coursework students to participate in research projects. VIT's research strength spans disciplines like CAD/CAM, Rapid Prototyping, Manufacturing, Product Design, Energy, Biomedical Research, Information Technology, Nanotechnology, Optoelectronics and Materials Engineering. The research output of many educational institutions is steadily growing - as indicated in the recently released report of Scopus, an abstracting and indexing database that includes over 19,000 titles from more than 5,000 international publishers.

OBJECTIVES

The objectives of the study were

- To identify the Views on e-resources
- To classify the respondents based on the views on e-resources.
- To identify their demographic details.

SAMPLE

The Vellore Institute of Technology (VIT) has two campuses viz Vellore campus and Chennai Campus. A total of 575 questionnaire were distributed of which 430 questionnaire were distributed in vellore campus and 145 distributed in Chennai campus among faculty and research scholars. The questionnaire distributed and responses received in each campus were shown in Table 1.

Table 1 Questionnaire Distributed and response

S.No	Position	Vellore campus			Chennai Campus			Overall Total	% of response
		Distributed	Received	%	Distributed	Received	%		
1	Faculty	230	203	88.26	75	64	85.33	267	52.68
2	Research scholars	200	181	90.50	70	59	84.28	240	47.32
	Total	430	384	89.30	145	123	84.82	507	100



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In all 430 questionnaires were distributed in Vellore campus, of which 230 were faculty members and 200 Research scholars. Out of 230 faculty members 203(88.26%) responded. Similarly out of 200 research scholars 181(90.50%) responded. Out 430 distributed 384 respondents and the response rate in Vellore campus works out to 89.30%. In the case of Chennai campus 145 questionnaires -75 faculty members and 70 research scholars – 123 responded and the response rate of Chennai campus works out 84.92%. Out of 575 questionnaire distributed 507 were responded and the response rate works out to 88.18%. Out of 507 respondents, 384 (75.74%) were from Vellore campus and the remaining 123 (24.26%) from Chennai campus. Further 267 (52.68%) belongs to faculty and 240 (47.32%) belongs to research scholars.

DEMOGRAPHIC DETAILS

The demographic details of the respondents of campus wise were shown in Table 2.

Table 2 Demographic detail of respondents

S.No	Description	Vellore		Chennai	
Category					
1	Research Scholar	181	75.4%	59	24.6%
2	Faculty	203	76.0%	64	24.0%
Gender					
1	Male	191	69.0%	86	31.0%
2	Female	193	83.9%	37	16.1%
Age					
1	21-30	217	90.4%	23	9.6%
2	31-40	111	60.7%	72	39.3%
3	41-50	37	66.1%	19	33.9%
4	50 and above	19	67.9%	9	32.1%
Domain					
1	Science	86	52.4%	24	8.4%
2	Engineering	262	91.6%	78	47.6%
3	Management	36	63.2%	21	36.8%
Overall					
	Total	384	75.7%	123	24.3%

In the case of Vellore campus, there are 203 (76.0%) responses received from Faculty members and 181 (75.4%) were Research scholars. In Chennai campus, there are 64 (24.0%) responses received from faculty members and 59 (24.6%) were research scholars. Out of 384 respondents from Vellore campus, 191(69.0%) were males and 193(83.9%) were females and in the case of Chennai campus 86(31.0%) were males and 37(16.1%) were females. Based on their age, the respondents are divided in to 4 groups such as in Vellore campus 21 to 30 (90.4%), 31-40 (60.7%), 41-50(66.1%), 50 and above (67.9%) and in the case of Chennai campus 9.6%, 39.3%, 33.9% and 32.1% respectively. Similarly based on the discipline, the respondents are divided in to three groups, Science 86(52.4%), Engineering 262(91.6%) and 36(63.2%) in Vellore campus. But in Chennai campus Science 78(47.6%), Engineering 24(8.4%) and Management 21(36.8%) responses received.

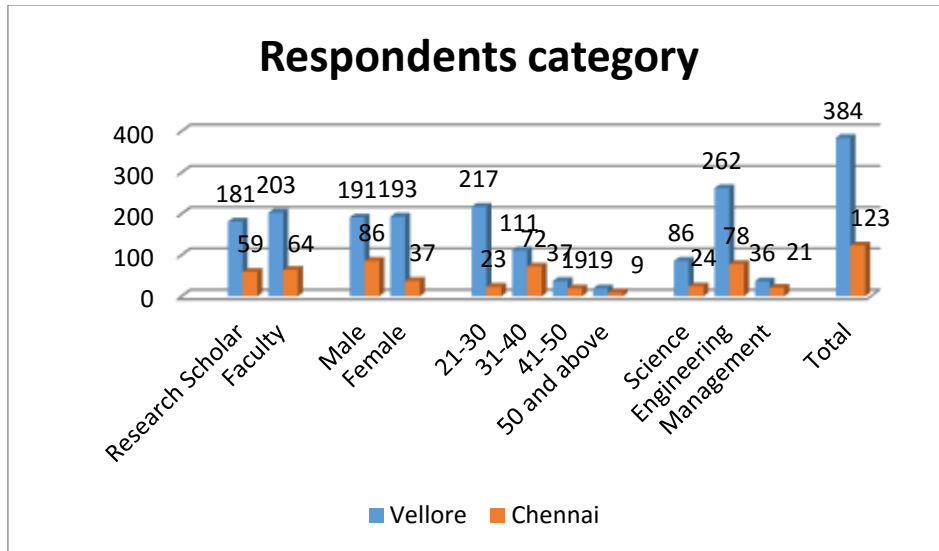


Fig. 1 Respondents category

GROUPING USERS BASED ON USE OF E-RESOURCES

The respondents' opinions were obtained in regard to use of e-resources. The questions that are posed to respondents through questionnaire were shown in table. The questions were coded and the same has been shown in Table 3.

Table 3 Variables code and description

S.No	Code	Description
1	SPO1	Electronic Resources are likely to replace print resources.
2	SPO2	Bottle neck in the development of E-Resources is lack of awareness on the part of the academic community.
3	SPO3	Developments of E-Resources are hampered due to lack of demand from the users.
4	SPO4	Lack of access to the computers to make use of Electronic collections is the cause for non-development of E-Resources.
5	SPO5	Library E-Resources are not used because of lack of skills of users.
6	SPO6	Most of the Libraries have not particular process for evaluating the resources before purchase.
7	SPO7	Downloading is a major problem in the use of E-Resources.
8	SPO8	Poor collection of materials in the digital library is the reason for its non-development.
9	SPO9	Most of the faculty members of Engineering colleges are familiar with usage of digital Resources.
10	SPO10	The Faculty members are using digital resources for enhancing and upgrading communication skills.
11	SPO11	All activities and programs in electronic information handling are to be based entirely on the needs of users.
12	SPO12	Students are leading users of E-Resources.
13	SPO13	More computer should be exclusively provided in the Library for the benefit of the faculty members than the present.
14	SPO14	Most of the faculty members are mainly using search Engines compared to other Digital Resources.
15	SPO15	Faculty members' attitudes seem to be very positive towards E-Resources for their study and research.
16	SPO16	Library hours to use the E-Resources facility to be provided to students at least 3 periods per week.
17	SPO17	Separate computer facility should be provided to the students at least with a ratio of 1:30.



18	SPO18	Basic training has to be given to students to effectively use the E-Resources of the library.
19	SPO19	Resources sharing provides greater access to Information Resources to a wide category of users
20	SPO20	Resource sharing can be activated by strengthening the existing consortia.
21	SPO21	Starting new consortia in a way may be helpful to resource sharing.
22	SPO22	Linking all the consortia may provide a better service.
23	SPO23	Management should provide necessary infrastructure for the success of E-Resources development.

Opinions on nearly 23 variables were obtained. Initially the reliability test was conducted to ensure the usability of the variables.

Reliability Test

Reliability analysis is a test on collected data to ensure that the data collected has reliable responses. The exploratory nature of the study has necessitated for data reliability analysis to check whether the items used in the measures are tapping to the same concept or not. Such test accomplished through the use of factor analysis. According to Coakes and Steed(2003)²¹, factor analysis is a data reduction technique used to reduce a large number of variables to a smaller set of underlying factors that summarize the essential information contained in the variables. Two widely used methods in factor analysis are Principal Components and Principal Axis Factoring. However, this study adopted the former and applied it to all variables that employed multi-items measures. Reliability is concerned with consistency of a variable. There are two identifiable aspects of this issue: external and internal reliability. Nowadays, the most common method of estimating internal reliability is Cronbachs alpha

(α). The formula used is
$$\alpha = \frac{K}{K - 1} \left(1 - \frac{\sum_{i=1}^K \sigma_{Y_i}^2}{\sigma_X^2} \right)$$

A commonly accepted rules for describing internal consistency using Cronbachs alpha (Cronbach, Lee and Shavelson 2004)²² are $\alpha \geq 0.9$ (Excellent), $0.9 > \alpha \geq 0.8$ (Good), $0.8 > \alpha \geq 0.7$ (Acceptable), $0.7 > \alpha \geq 0.6$ (Questionable), $0.6 > \alpha \geq 0.5$ (Poor) and $0.5 > \alpha$ (Unacceptable).

The concepts taken up for the study, variables and the Cronbach alpha value are shown in Figure 3.

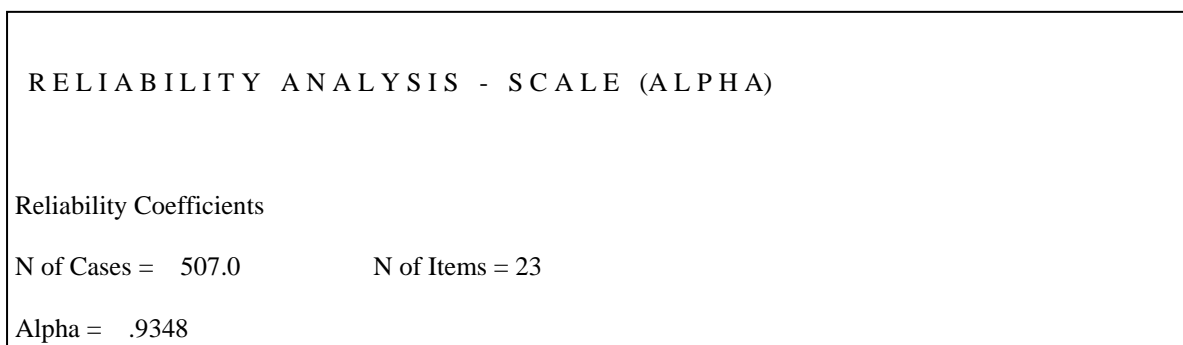


Fig 2 Reliability Analysis

Since the alpha value works out 0.9348 which indicates that the variables thus taken up for the study were holds good.


Views on e-resources

The respondents' views on e-resources have been analyzed based on the 23 variables. The opinion of the respondents were obtained in a five point scale such as 'Strongly disagree'; 'Disagree'; 'No Opinion'; 'Agree'; 'Strongly agree'. The mean and standard deviation were calculated. The ranks were assigned based on mean and standard deviation. The variables, respondents' opinion, mean, standard deviation and rank were provided in Table 4.

Table 4 Views on of e-resources

S.No	Code	SD	D	No	A	SA	Mean	Std	Rank
1	SPO1	52 (10.3)	26 (5.1)	38 (7.5)	307 (60.6)	84 (16.6)	3.68	1.127	22
2	SPO2	14 (2.8)	43 (8.5)	70 (13.8)	317 (62.5)	63 (12.4)	3.73	.884	19
3	SPO3	13 (2.6)	53 (10.5)	65 (12.8)	305 (60.2)	71 (14.0)	3.73	.919	20
4	SPO4	29 (5.7)	46 (9.1)	71 (14.0)	258 (50.9)	103 (20.3)	3.71	1.067	21
5	SPO5	24 (4.7)	49 (9.7)	71 (14.0)	216 (42.6)	147 (29.0)	3.81	1.100	17
6	SPO6	13 (2.6)	43 (8.5)	99 (19.5)	201 (39.6)	151 (29.8)	3.86	1.022	14
7	SPO7	20 (3.9)	41 (8.1)	75 (14.8)	220 (43.4)	151 (29.8)	3.87	1.053	11
8	SPO8	30 (5.9)	79 (15.6)	83 (16.4)	170 (33.5)	145 (28.6)	3.63	1.214	23
9	SPO9	15 (3.0)	42 (8.3)	79 (15.6)	227 (44.8)	144 (28.4)	3.87	1.012	12
10	SPO10	18 (3.6)	32 (6.3)	84 (16.6)	238 (46.9)	135 (26.6)	3.87	.994	13
11	SPO11	35 (6.9)	6 (1.2)	63 (12.4)	308 (60.7)	95 (18.7)	3.83	.977	16
12	SPO12	12 (2.4)	29 (5.7)	40 (7.9)	310 (61.1)	116 (22.9)	3.96	.866	9
13	SPO13	13 (2.6)	45 (8.9)	91 (17.9)	255 (50.3)	103 (20.3)	3.77	.958	18
14	SPO14	11 (2.2)	30 (5.9)	65 (12.8)	251 (49.5)	150 (29.6)	3.98	.926	7
15	SPO15	11 (2.2)	21 (4.1)	54 (10.7)	262 (51.7)	159 (31.4)	4.06	.883	1
16	SPO16	19 (3.7)	43 (8.5)	92 (18.1)	193 (38.1)	160 (31.6)	3.85	1.074	15
17	SPO17	15 (3.0)	41 (8.1)	85 (16.8)	205 (40.4)	161 (31.8)	3.90	1.033	10
18	SPO18	13 (2.6)	33 (6.5)	43 (8.5)	256 (50.5)	162 (32.0)	4.03	.947	2
19	SPO19	21 (4.1)	11 (2.2)	52 (10.3)	278 (54.8)	145 (28.6)	4.02	.922	4
20	SPO20	14 (2.8)	17 (3.4)	73 (14.4)	260 (51.3)	143 (28.2)	3.99	.900	6
21	SPO21	13 (2.6)	16 (3.2)	84 (16.6)	247 (48.7)	147 (29.0)	3.98	.902	8
22	SPO22	16 (3.2)	17 (3.4)	64 (12.6)	264 (52.1)	146 (28.8)	4.00	.913	5
23	SPO23	18 (3.6)	15 (3.0)	38 (7.5)	297 (58.6)	139 (27.4)	4.03	.887	3

It is seen from table 4 that more than 70% of the respondents opinion were between 'agree' and 'strongly agree'. The first view was 'Respondents attitudes seem to be very positive towards E-Resources for their study and research'. It is followed by 'Basic training has to be given to students to effectively use the E-Resources of the library' and 'Management should provide necessary infrastructure for the success of E-Resources development'. Among the 23 variables, the variable 'Poor collection of materials in the digital library is the reason for its non-development' was given least preference followed with 'Electronic Resources are likely to replace print resources'. The mean value for the above variables ranges between 3.63 and 4.06 which indicate that the value lies between 'Agree' and 'Strongly Agree'. The standard deviation value ranges between 0.866 and 1.214 which indicates that there is no significant deviation among the respondents on their opinion.

The Hierarchical Cluster Analysis has been employed for grouping of variables based on the responses. The dendrogram using average linkage between groups thus drawn was shown in Figure 3.



Dendrogram using Average Linkage (Between Groups)

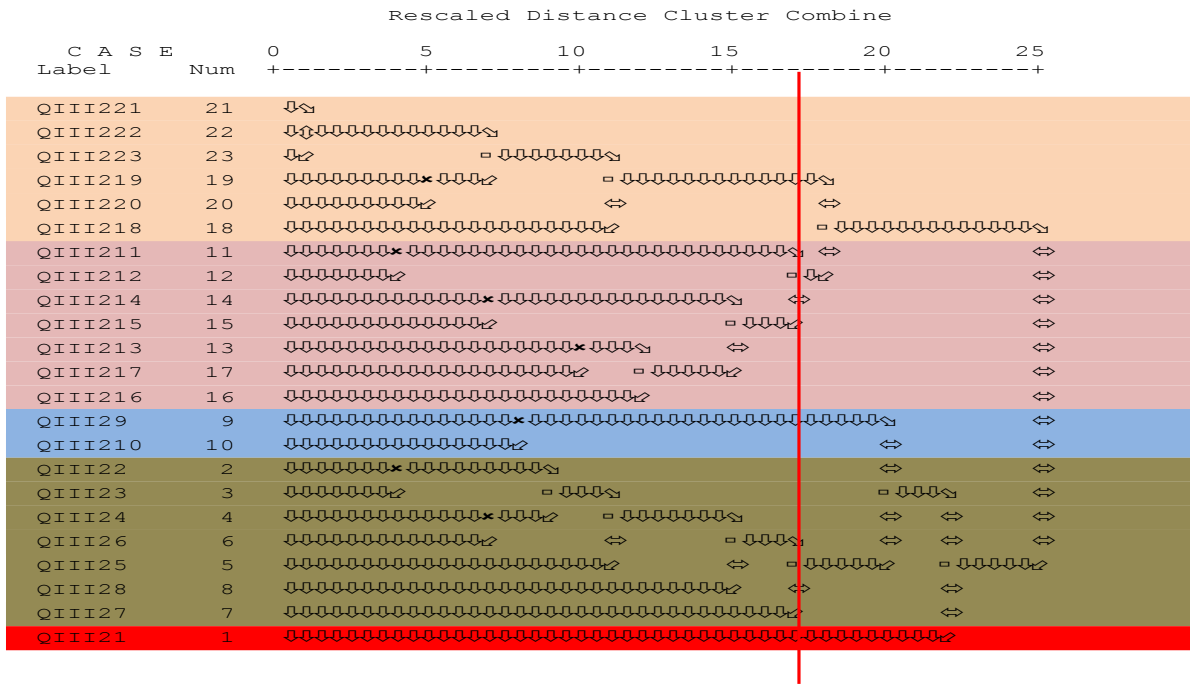


Fig 3 Hierarchical cluster analysis

In can be seen from the dendrogram that at 70% level, their exist five interpretable clusters. The cluster one comprises of one variable formed as isolated cluster. The second cluster comprises of seven variables. The third cluster comprises of only 2 variables. The fourth and fifth cluster comprises of seven and six variables respectively. The cluster along with variable code and description were shown in Table 5

Table 5 Cluster table

Cluster No	S. No	Code	Description
1	1	SPO1	Electronic Resources are likely to replace print resources.
2	2	SPO2	Bottle neck in the development of E-Resources is lack of awareness on the part of the academic community.
	3	SPO3	Developments of E-Resources are hampered due to lack of demand from the users.
	4	SPO4	Lack of access to the computers to make use of Electronic collections is the cause for non-development of E-Resources.
	5	SPO5	Library E-Resources are not used because of lack of skills of users.
	6	SPO6	Most of the Libraries have not particular process for evaluating the resources before purchase.
	7	SPO7	Downloading is a major problem in the use of E-Resources.
	8	SPO8	Poor collection of materials in the digital library is the reason for its non-development.
3	9	SPO9	Most of the faculty members of Engineering colleges are familiar with usage of digital Resources.
	10	SPO10	The Faculty members are using digital resources for enhancing and upgrading communication skills.
4	11	SPO11	All activities and programs in electronic information handling are to be based entirely on the needs of users.
	12	SPO12	Students are leading users of E-Resources.
	13	SPO13	More computer should be exclusively provided in the Library for the benefit of the faculty members than the present.



	14	SPO14	Most of the faculty members are mainly using search Engines compared to other Digital Resources.
	15	SPO15	Faculty members' attitudes seem to be very positive towards E-Resources for their study and research.
	16	SPO16	Library hours to use the E-Resources facility to be provided to students at least 3 periods per week.
	17	SPO17	Separate computer facility should be provided to the students at least with a ratio of 1:30.
5	18	SPO18	Basic training has to be given to students to effectively use the E-Resources of the library.
	19	SPO19	Resources sharing provides greater access to Information Resources to a wide category of users
	20	SPO20	Resource sharing can be activated by strengthening the existing consortia.
	21	SPO21	Starting new consortia in a way may be helpful to resource sharing.
	22	SPO22	Linking all the consortia may provide a better service.
	23	SPO23	Management should provide necessary infrastructure for the success of E-Resources development.

Exploratory Factor Analysis (EFA)

The responses thus received based on opinion on e-resources has been further analyzed through statistical procedures to determine the opinion among the faculties and researchers.. There are many factors that contribute for the opinion on e-resources towards effective utilization of e-resources. Few of them were technology know-how, the attitude, quality of technology, quality of system, trainings arranged by the institutes, awareness and ability to understand the required e-resources, the role of proficiency, positive response, support from organisations, participative nature, training, and action focused.

To explore the relative factor a statistical procedure to determine the factors has been employed. This procedure is generally known as Exploratory Factor Analysis (EFA). Further multidimensional are treated with EFA to analyze their dimensions and variation extraction through each dimension. Exploratory factor analysis is a statistical method to investigate linearity of number of variables of interest to a smaller number of unobservable factors; parameters of linear functions are called factor loadings. Exploratory factor analysis consists of two stages. First one loading set is calculated that shows theoretical variances and covariance which fit the observed ones as closely as possible. A method generally used to determine a first set of loadings is called the principal component method. These loadings might not agree with the prior expectations, or might not have reasonable interpretation. so second stage consist of factor rotation to find the point of loadings that fit equally well the observed variances and covariance's and interpreted more easily. There are a number of methods in order to obtain first and rotated factor solutions, and each solution might give rise to a different interpretation. Study used Varimax rotation method that encourages the detection of factors each of which is related to few variables and on the other hand it discourages the detection of factors that are influencing all variables. There is substantial subjectivity in the interpretation of factors and determining the number of factors. Acceptable value for the factor loading is 0.50. Table indicated maximum values of factors loadings are above 0.50.

Using Varimax Rotation

The method of grouping the users based on the opinion of group of variables using rotated component matrix has been adopted in several studies. (Gopalakrishnan et al²³, Mohanraj et al²⁴). In this study, based on the respondents' opinions thus ascertained on 16 variables which has been considered as Strategies and skills for the employees of retail fashion retain outlet has been grouped using rotated component matrix. The component thus extracted on eight iterations has been shown in Table 6.

Table 6 Rotated Component Matrix

S.No	Var.No	Description	Pessimist	Optimist	environs	prejudiced	Futurist
1	4	SPO4	.857				
2	6	SPO6	.826				
3	3	SPO3	.787				
4	5	SPO5	.751				
5	2	SPO2	.711				
6	8	SPO8	.697				
7	7	SPO7	.502				
8	23	SPO23		.796			



9	18	SPO18		.596			
10	20	SPO20		.820			
11	21	SPO21		.857			
12	19	SPO19		.737			
13	22	SPO22		.835			
14	17	SPO17			.739		
15	13	SPO13			.751		
16	16	SPO16			.708		
17	14	SPO14			.675		
18	15	SPO15			.659		
19	10	SPO10				.776	
20	9	SPO9				.794	
21	11	SPO11					.752
22	12	SPO12					.774
23	1	SPO1					.557
		Eigen values	9.548	2.975	1.734	1.259	1.165
		% of Variance	20.676	19.100	14.361	9.202	9.188
		Cumulative %	20.676	39.776	54.137	63.339	72.527

Exploratory Factor Analysis converted the 23 items (questions) into 5 factors which further suggested names according to the nature of items included in the factors. Factor one has been named as Pessimist contains 7 items which has loading ranging between 0.502 and 857. The second factor, named as Optimist, is inquisitive having 6 items having the ranging factor loading 0.596 to 0.857. Five items of factor 3 related to Environs having loading range 0.659 to 0.751. The prejudiced factor has two items with loading 0.776 and 794. The factor four related to Futurist having 3 items and loading ranging 0.557 to 0.774.

As it can be seen from the table 6, Eigen values were calculated for 23 variables. The five factors have Eigen values greater than 1. "1" was the criterion for retention of a factor, which indicates that only the five factors are to be extracted. It can be seen that the variances were evenly distributed in the rotated sum of the squared loading (20.676%, 39.776%, 54.137%, 63.339% and 72.527% respectively), which shows that the 23 factors are interpretable.

Based on the component the respondents were grouped as Pessimist, Optimist, Environs, Prejudiced, and Futurist. The number respondents of each category were shown in Table 7.

Table 7 Type of users

S.No	Type of users	Respondents	Percent	Cum. Percent
1	Pessimist	141	27.8	27.8
2	Optimist	62	12.2	40.0
3	Environs	107	21.1	61.1
4	Prejudiced	108	21.3	82.4
5	Futurist	89	17.6	100.0
	Total	507	100.0	

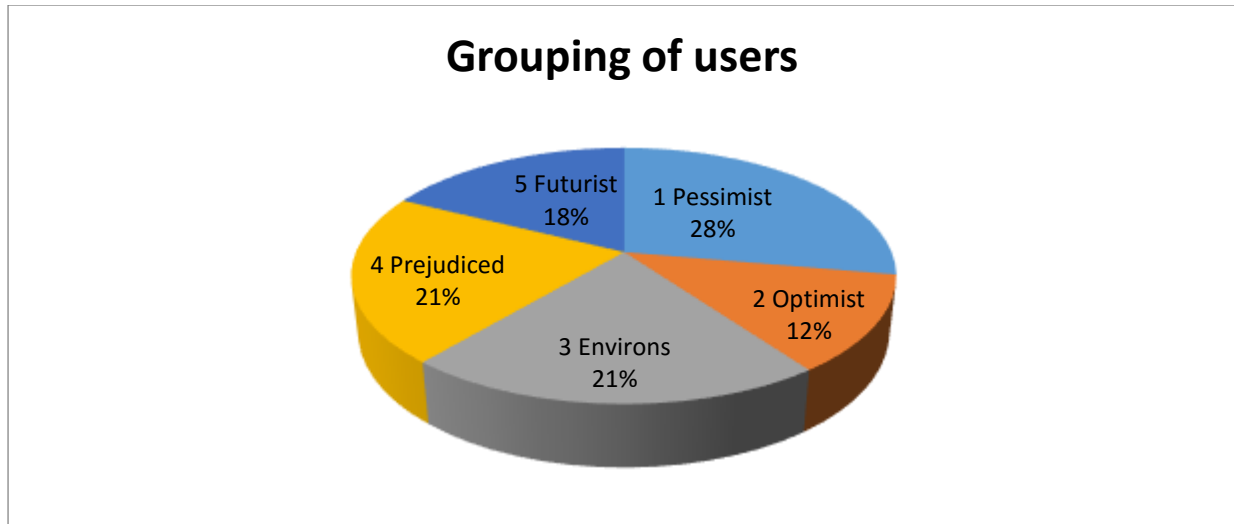


Fig. 4 Grouping of users

Nearly 27.8% were pessimist. It is followed by prejudiced user (21.3%) and environs (21.1%). 17.6% of respondents were Futurist and 12.2% were optimist.

The demographic details of the respondents based on the user group were also identified and the same has been shown in Table 8.

Table 8 Type of Users Vs Demographic details

S.No	Description	Pessimist	Optimist	Environs	Prejudised	Futurist	Total
Category							
1	Research Scholar	64	32	48	49	47	240
		12.6%	6.3%	9.5%	9.7%	9.3%	47.3%
2	Faculty	77	30	59	59	42	267
		15.2%	5.9%	11.6%	11.6%	8.3%	52.7%
Gender							
	Male	84	32	54	55	52	277
		16.6%	6.3%	10.7%	10.8%	10.3%	54.6%
	Female	57	30	53	53	37	230
		11.2%	5.9%	10.5%	10.5%	7.3%	45.4%
Place							
	Vellore	105	46	87	85	61	384
		20.7%	9.1%	17.2%	16.8%	12.0%	75.7%
	Chennai	36	16	20	23	28	123
		7.1%	3.2%	3.9%	4.5%	5.5%	24.3%
Age Group							
	21-30	105	44	87	87	59	382
		20.7%	8.7%	17.2%	17.2%	11.6%	75.3%
	31-40	29	14	17	12	25	97
		5.7%	2.8%	3.4%	2.4%	4.9%	19.1%
	41-50	4	2	2	7	4	19



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		.8%	.4%	.4%	1.4%	.8%	3.7%
	50 and above	3	2	1	2	1	9
		.6%	.4%	.2%	.4%	.2%	1.8%
Domain							
	Engineering	40	22	41	31	30	164
		7.9%	4.3%	8.1%	6.1%	5.9%	32.3%
	Science	88	31	54	65	48	286
		17.4%	6.1%	10.7%	12.8%	9.5%	56.4%
	Management	13	9	12	12	11	57
		2.6%	1.8%	2.4%	2.4%	2.2%	11.2%
Overall							
		141	62	107	108	89	507
		27.8%	12.2%	21.1%	21.3%	17.6%	100.0%

FINDINGS

The findings of the study are

- Out of 575 questionnaires distributed 507 were responded and the response rate works out to 88.18%. Out of 507 respondents, 384 (75.74%) were from Vellore campus and the remaining 123 (24.26%) from Chennai campus. Further 267 (52.68%) belongs to faculty and 240 (47.32%) belongs to research scholars.
- The reliability test was conducted to ensure the usability of the 23 variables. The Cronbach alpha value, a bench mark for Reliability test, for the use of e-resources and opinion on available e-resources works out 0.9348 which is greater than 0.7 indicates that the 23 variables thus taken up for the study were holds good.
- More than 70% of the respondents opinion were between 'agree' and 'strongly agree'. The mean value for the above variables ranges between 3.63 and 4.06 which indicate that the value lies between 'Agree' and 'Strongly Agree'. The standard deviation value ranges between 0.866 and 1.214 which indicates that there is no significant deviation among the respondents on their opinion.
- The first view was 'Respondents attitudes seem to be very positive towards E-Resources for their study and research'. It is followed by 'Basic training has to be given to students to effectively use the E-Resources of the library' and 'Management should provide necessary infrastructure for the success of E-Resources development'.
- Among the 23 variables, the variable 'Poor collection of materials in the digital library is the reason for its non-development' was given least preference followed with 'Electronic Resources are likely to replace print resources'.
- The Hierarchical Cluster Analysis has been employed for grouping of variables based on the responses. The dendrogram shows, at 70% level, shows five interpretable clusters. The cluster one comprises of one variable formed as isolated cluster. The second cluster comprises of seven variables. The third cluster comprises of only 2 variables. The fourth and fifth cluster comprises of seven and six variables respectively.
- Exploratory Factor Analysis converted the 23 items (questions) into 5 factors which further suggested names according to the nature of items included in the factors. Based on the component the respondents were grouped as Pessimist, Optimist, Environs, Prejudiced, and Futurist.
- Nearly 27.8% were pessimist. It is followed by prejudiced user (21.3%) and environs (21.1%). 17.6% of respondents were Futurist and 12.2% were optimist.



CONCLUSION

Both faculty and students use and like electronic resources and most readily adopt them if the sources are perceived as convenient, relevant, and time saving to their natural workflow.

Tenopir (2003)²⁵ identified seven categories of e-journal users such as *enthused* (wide use of journals and articles); *journal-focused* (many sessions but concentrated on 4 or 5 specific journal titles and 50% full text, mostly scientists and graduate students), *topic-focused* (searched less often and by subject rather than specific journals, used many articles, mostly social scientists); *article-focused* (searched less often, only on one journal, mostly scientists); *bingers* (mostly social science students); *explorers* (users across all disciplines, used tables of contents in multiple journals) and *window-shoppers* (users who viewed the journal system just once and did not use the full-text database). Similarly in this study based on the respondents views on e-resources the authors categorized the users as *Pessimist*, *Optimist*, *Environs*, *Prejudiced*, and *Futurist*.

The suggestions expressed by the respondents were Make it easier to use and access library information; Make both print and electronic journals available; Provide links to other library and research sites; Shortage of knowledgeable librarians; lack of customer orientation; inability to access databases remotely; comprehensiveness of collection of full-text articles online, and convenience of borrowing books from other colleges; availability of online help when using their library's electronic resources.

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