

Full Length Research Paper

Library use pattern by the faculty members of the engineering colleges in Karnataka: A study

B. U. Kannapanavar^{1*} and K. V. Manjunatha²

¹University Library, Kuvempu University, Jnana Sahyadri, Shankaraghatta-577451, Karnataka, India.

²Librarian, Bapuji Institute of Engineering and Technology, Davanagere, Karnataka, India.

Accepted 28 November, 2010

The study discusses the issues like access tools used for locating reading materials, frequency of visits to library by the Faculty; time spent in the library, use of library services, faculty opinion about library had been discussed. The study found that 53.2% of users are using online public access catalogue (OPAC) to locate their reading materials, 48.8% of the users are consulting the librarian and library staff for locating the documents. 28.4% of users visiting the library once in a week followed by 27.4% visiting twice a week. 75% of all the users are spending less than 5 h per week in the library, 61.86% users are using reference services, and 48.5% of users are opined that they are getting their required reading materials within time.

Key words: Karnataka, library, teachers, users, engineering colleges.

INTRODUCTION

Engineering and Technical Education is a pre-requisite for sustaining the complex structure of modern civilization and for the achievement of socio-economic goals of any nation. The main benefits of technical education to the students can be summarized as gaining confidence in decision making, reading theory to practice, and increased jobs opportunities, realization of responsibility, opportunities to work with modern equipment and on problems of current importance. Hence, there is a great need for high quality technical education to produce technically skilled manpower in India. The quality of educational system in any society is a measure of its development and competitiveness vis-à-vis other contemporary societies. In the present age of knowledge explosion, where new technologies are being developed at rapid pace, their assimilation with the existing knowledge, development of infrastructure, importing education and training to cater to the growing requirement for the qualified and trained man power for the operationalization of technologies, are the responsibility of the engineering education system. As different levels of competencies are required to perform different jobs, there are separate educational institutions to import education and training at different levels (Sharma, 2001).

Engineering education in India began with the establishment of the Government colleges of engineering (survey school) at Gundy (Tamil Nadu) in 1794, which was followed by the Thomson Engineering college at Roorkee (U.P) in 1847 and B.E. college, Howrah (West Bengal) in 1856.

In the next 90 years not much progress was made (Achintya and Mishra, 2000). Engineering education in India is broadly structured into three levels: At the initial level industrial training institutes (ITIs) offer certificate courses; then polytechnics offer diploma courses and finally engineering colleges (government, private management and regional engineering college) and IITs offer graduate- bachelor of engineering (BE) and bachelor of technology (B. Tech), post graduate- master in technology (M. Tech) and master of engineering (M. E) degree courses and they also offer doctor of philosophy (PhD) programmes.

In 1947, there were only around 38 engineering colleges with a total intake of 1850 students (Database of ISTE, 2000). After Independence, there has been tremendous growth in the field of engineering education. Many new colleges were established in the country with the Government assistance as well as with private initiatives initially in the south and then in other parts of the country. During 1980-1981 there were 157 engineering institutions in India. The number increased to 663 during 1999-2000, and in the year 2000-2001, it was 880 institutions. There were 1346 engineering colleges in 2004- 2005,

*Corresponding author. E-mail: kannappanavar@yahoo.co.in.
Tel: +91 9480329897.

and the number increased to 1478 engineering institutions during the year 2006-07, providing technical education at the graduate, post graduate level in the country (Raja and Ratnam, 2007).

ROLE OF TEACHERS IN ENGINEERING COLLEGES

The teachers of technical institutions play a vital role in technical teaching in engineering education. Their role in education is more significant. The teacher should have the potential in such a way to spread the technical knowledge, to give general information and to have control over the students (Saravan, 2005). Teaching is a complex activity involving many variables and teachers have a number of responsibilities; apart from their main task of teaching in the classroom, they have to perform multidimensional role as an engineer: Activity including diagnosing students with learning difficulties; a guide: Supervising research activities and co-coordinator.

Engineering teachers essentially need practice in two professions: Engineering and teaching, Teachers should have the ability to stimulate and inspire the students to the soul of any academic institutions. The engineering faculty has different specialized functions, which vary from institution to institution. To perform the teaching effectively at an engineering college, teachers require a variety of information. The provision of the right information at the right time is vitally important if teachers are to effectively teach their students.

The increase in the quantity of information related to engineering and technology is being phenomenal. Additionally, the quality of information communication and generation had improved and is available in various forms and formats. As underlying premise of this study, engineering teaching faculty must deal effectively and efficiently with these mentioned factors, quality and form of information in order to productively instruct their students.

The standard and reputation of engineering college is evaluated on the performance of the academic community of that institution. The performance here means the quality and number of research projects undertaken and information generated in the form of publication of articles, textbooks, monographs, submission of papers to seminars and conferences and research guidance leading to PhD. Thus the faculty members play a key role in building the image of the engineering college.

The engineering faculty, contributing much in this modern electronic and technological world, is the focus of the study. The study is primarily aimed at evaluating the performance of teachers in the form of information generation, communication against cadre, service and gender. Further the study should concentrate on the impact of helpful factors on information generation, communication by teachers. Other factors are barriers on information communication, library use, reading habits, etc.

ROLE OF LIBRARIES IN ENGINEERING COLLEGE

The library is regarded as the 'nerve centre of knowledge', the centre of intellectual life and the heart and soul of the academic institution. This means that discoveries are actually made in the library and subsequently tested in the laboratory. It occupies an important place in the modern education system and maintains the expensive educational resources of the academic institutions. It is the responsibility of the staff of engineering and technical libraries to provide right information at the right time to right user to save the time of the user.

The libraries are primarily responsible for the selection and collection of material appropriate for libraries, preservation and organization of the collection and dissemination of the material or the information, which it contains.

Libraries as centre of learning are playing an important role in sustaining and satisfying the information requirements of parent institutions. For the efficient, effective and scientific development of information resources and services, the libraries need to be designed and developed systematically based on the inputs from studies on existing resources and services, and the studies on users of engineering college libraries.

Objectives of the study

The main objectives of this study are:

1. To find out the frequency of use of information sources by engineering faculty.
2. To trace out the awareness of library services and its usage among the faculty members.
3. To find out the frequency of visit to library by engineering faculty.
4. To know the time spent in reading at various places by the engineering faculty.
5. To find out the use of library services by engineering faculty.
6. To trace out the faculty opinion about the engineering college library.

Hypotheses

Based on the objectives, the following hypotheses have been drafted for this study:

1. All the access tools used for locating reading materials among engineering faculties are alike.
2. The frequency of visit to library is unequal among the engineering faculties.
3. There is an unequal use of library services among the engineering faculties.

Table 1. Access tools used for locating reading materials by engineering faculty.

Access tools	No. of engineering faculty cadre wise			
	Professor N=139	Assistant professor N=194	Lecturer N=417	Total N=750
By consulting library catalogue / OPAC	80 (57.55)	129 (66.49)	190 (45.56)	399 (53.20)
Abstracting and indexing periodicals / journals	25 (17.98)	40 (20.61)	51 (12.23)	116 (15.46)
Current awareness bulletins (e. g. List of additions) of library	30 (21.58)	43 (22.16)	65 (15.58)	138 (18.4)
Reference from bibliographic and review of literature	22 (15.82)	31 (4.13)	53 (12.70)	106 (14.13)
Browsing publishers catalogue	16 (11.51)	22 (2.93)	46 (11.03)	84 (11.2)
Browsing in bookshops	24 (17.26)	35 (4.66)	54 (12.94)	113 (15.06)
Consulting colleagues and fellow professionals	29 (20.86)	41 (5.46)	57 (13.66)	127 (16.93)
Consulting Librarian / library staff	78 (56.11)	122 (62.88)	166 (39.80)	366 (48.80)
Other	06 (4.31)	09 (4.63)	18 (4.31)	33(4.4)

Figures in parentheses show the percentage.

METHODOLOGY

The survey method was employed to collect the required data. A detailed questionnaire was prepared for this purpose and in order to enhance the validity and reliability of the questionnaire, experts in the field of library science, psychology and statistics were consulted and were requested to review the questionnaire critically. Questionnaire was revised based on the suggestions.

The investigators personally visited all the engineering colleges under study. Teachers' questionnaires were distributed in the concerned departments. Researcher stayed for one or two days in each college, explained the importance of the research work being undertaken to get the response. Simple random sampling technique was applied to obtain representative sample.

DATA ANALYSIS AND INTERPRETATION

Awareness of library services and its usage

Access tools used for locating reading materials by engineering faculty

Table 1 shows that, 57.55% of professors, 66.49% of assistant professors and 45.56% of lecturers use catalogue and OPAC to locate their reading materials. 17.98% professors, 20.61% of assistant professors and 12.23% of lecturers use abstracting and indexing journals to locate the required information. 21.58% of professors, 22.16% of assistant professors and 15.58% of lecturers use current awareness bulletins of their respective library to search their needed information. 15.82% of professors, 4.13% assistant professors and 12.70% lecturers use references, bibliographic and review of literature to locate their information.

Browsing publishers' catalogue is another access tool to identify the required information by the engineering faculty. This accounted to 11.51% of professors, 2.93% of assistant professors and 11.03% of lecturers, respectively. 17.26% professors, 4.66% of assistant professors and 12.94% of lecturers are also browsing in bookshop to locate their needed documents.

20.86% of professors, 5.46% of assistant professors and 13.66% lecturers locate their needed information either by consulting their colleagues or fellow professionals. 56.11% professors, 62.88% assistant professors and 39.80% lecturers consult librarian or library staff of their respective library to locate the required information. It is observed from Table 2 that 53.20% of teaching faculty of

engineering colleges in Karnataka uses 'library catalogue/OPAC' to locate reading materials, which clearly shows its primary importance as access tools. 48.80% of the engineering faculty locates reading materials by consulting 'librarian/library staff', this indicates its secondary importance as an access tools. Among the respondents, 18.4% uses 'current awareness bulletins' to locate reading materials. Where as 16.93% of engineering faculties 'consult colleagues and fellow professionals' to locate reading materials. Abstracting and indexing journals' are being used by 15.46% of respondents and 4.4% of respondents use other access tools to locate reading materials.

Using one-way analysis of variance (ANOVA) technique tested the significance of access tools used for locating reading materials by engineering faculty, the following hypotheses are framed to Table 2.

Hypotheses

1. All the access tools used for locating reading materials among engineering faculties are alike.
2. All the access tools used for locating reading materials among engineering faculties are different.

Using coding method that is, all the n items values (Table 2) are divided by 750 and multiplied by 100 to reduce big figures in magnitude to simplify the computation work.

$$\bar{X} = \frac{\bar{X}_1 + \bar{X}_2 + \bar{X}_3}{\text{No. of sample (k)}} = \frac{4.51+6.98+10.36}{3} = \frac{21.85}{3} = 7.28$$

$$SS \text{ between} = n_1 (\bar{X}_1 - \bar{X})^2 + n_2 (\bar{X}_2 - \bar{X})^2 + \dots \dots n_k (\bar{X}_k - \bar{X})^2$$

$$SS \text{ between samples} = 69.05+0.81+85.37=155.23$$

$$SS \text{ with in samples} = \sum (X_{1i} - \bar{X}_1)^2 + \sum (X_{2i} - \bar{X}_2)^2 + \sum (X_{3i} - \bar{X}_3)^2, \quad i=1,2,3$$

$$SS \text{ with in samples} = 104.06+183.61+ 487.92=775.59$$

$$SS \text{ for total variance} = \sum (X_{ij} - \bar{X})^2 \quad i=1,2,3.. \quad j= 1, 2, 3...$$

Table 2. Reduced figures of access tools used for locating reading materials by engineering faculty.

Access tools	Professor	Assistant professor	Lecturer
By consulting library catalogue / OPAC.	10.66	17.20	25.33
Abstracting and indexing periodicals / journals.	3.33	5.33	6.8
Current awareness Bulletins (e. g. List of additions) of library	4	5.73	8.66
Reference from bibliographic and review of literature	2.93	4.13	7.06
Browsing publishers' catalogue.	2.13	2.93	6.13
Browsing in bookshops.	3.2	4.66	7.2
Consulting colleagues and fellow professionals	3.86	5.46	7.6
Consulting Librarian / library staff	10.4	16.26	22.13
Other	0.08	1.2	2.4
N=9, K=3	$\bar{X}_1=40.5/9$	$\bar{X}_2=62.9/9$	$\bar{X}_3=93.31/9$
Mean	=4.51	=6.98	=10.36

Table 3. ANOVA table for access tools used for locating reading materials by engineering faculty.

Source of variation	Sum of squares (SS)	Degrees of freedom (d.f.)	Mean square (MS)	F – ratio	5% F-limit (from F-table)
Between samples	155.23	(k-1) (3-1)=2	$\frac{SS \text{ between}}{(k-1)}$ 155.23/2=77.61	$\frac{MS \text{ between}}{MS \text{ within}}$ 77.61/32.31 =2.40	F (2,24)=3.40
With in sample	775.59	(n-k) (27-3)= 24	$\frac{SS \text{ within}}{(n-k)}$ 775.59/24=32.31		2.40<3.40
Total	930.82	(n-1) (27-1)=26			

SS for total variance =930.82

SS fir total variance can also be worked out;

SS for total = SS between + SS within

= 155.23+775.59=930.82

ANOVA table for this problem was then set up. The data in the Table 3 tested the significance by using one-way ANOVA technique. The calculated value of F-ratio 2.40 is less than the F-table value 3.40 with 5% significance with d. f. (2.24) and hence could be arisen due to chance the null hypothesis is accepted. Therefore, all the access tools used for locating reading materials among engineering faculties are alike.

Frequency of visit to library by engineering faculty

It is observed from Table 4 that 32.37% professors visit the library 'once in a week', 18.70% of professors visit 'twice a week' and 17.27% of professors visit the library 'once in fortnight' and 'once in a month'. From Table 4, it could be seen that 14.39% of professors visit the library 'thrice a week'. Table 4 clearly shows that, 40.72% of assistant professors visit library 'once a week' 26.29% of

assistant professors visit library 'twice a week' and 12.89% of assistant professors visit the library 'thrice a week'. Where as, 10.31, 9.79% of assistant professors visit the library 'once in fortnight' and 'once in a month', respectively. Further, it is observed from Table 4 that, 30.94, 25.90% of lecturers visit the library 'twice a week' and 'thrice a week', respectively. Whereas 21.34, 11.03 and 10.79% of lecturers visit the library 'once in a week', 'once in fortnight' and 'once in a month', respectively.

'Once in a week' is the frequency of library visits by teaching faculty of engineering colleges in Karnataka irrespective of cadre. Further it is observed that 24.47 and 20.4% of respondents visits the library 'twice a week' and 'thrice a week', respectively. Among the engineering faculty 12 and 11.73% visit the library 'once in fortnight' and 'once in a month', respectively.

Using one-way ANOVA technique tested the significance of frequency of visit to library by engineering faculty; following hypotheses are framed to Table 4

Hypotheses

1. The frequency of visit to library is unequal among the engineering faculties.
2. The frequency of visit to library is equal among the engineering faculties.

Table 4. Frequency of visit to library by engineering faculty.

Frequency	No. of engineering faculty cadre wise			
	Professor N=139	Assistant professor N=194	Lecturer N=417	Total N=417
Once in a week	45 (32.37)	79 (40.72)	89 (21.34)	213 (28.4)
Thrice a week	20 (14.39)	25 (12.89)	108 (25.90)	153 (20.4)
Twice a week	26 (18.70)	51 (26.29)	129 (30.94)	206 (27.47)
Once in fortnight	24 (17.27)	20 (10.31)	46 (11.03)	90 (12.00)
Once in a month	24 (17.27)	19 (9.79)	45 (10.79)	88 (11.73)

Figures in parentheses show the percentage.

Table 5. Reduced figures of frequency of visit to library by engineering faculty.

Frequency	Professor	Assistant professor	Lecturer
Once in a week	6	10.53	11.86
Twice a week	3.46	6.8	17.20
Thrice a week	2.66	3.33	14.4
Once in fortnight	3.2	2.66	6.13
Once in a month	3.2	2.53	6
N=6, K=3	—	—	—
Mean	$X_1=18.52/6$ =3.08	$X_2=25.85/6$ =4.30	$X_3=55.59/6$ =9.26

Using coding method that is, all the n items values (Table 4) are divided by 750 and multiplied by 100 to reduce big figures in magnitude so computation work is simplified without any disturbance in setting up Table 5.

$$\bar{X} = \frac{\bar{X}_1 + \bar{X}_2 + \bar{X}_3}{\text{No. of sample (k)}} = \frac{3.08 + 4.30 + 9.26}{3} = \frac{16.64}{3} = 5.54$$

$$SS \text{ between} = n_1(\bar{X}_1 - \bar{X})^2 + n_2(\bar{X}_2 - \bar{X})^2 + \dots + n_k(\bar{X}_k - \bar{X})^2$$

$$SS \text{ between samples} = 36.30 + 9.22 + 83.03 = 128.55$$

$$SS \text{ with in samples} = \sum(X_{1i} - \bar{X}_1)^2 + \sum(X_{2i} - \bar{X}_2)^2 + \sum(X_{3i} - \bar{X}_3)^2, \quad i=1,2,3$$

$$SS \text{ with in samples} = 18.33 + 70.3 + 202.36 = 290.99$$

$$SS \text{ for total variance} = \sum(X_{ij} - \bar{X})^2 \quad i=1,2,3.. \quad j=1,2,3..$$

$$SS \text{ for total variance} = 419.54$$

SS fir total variance can also be worked out;

$$SS \text{ for total} = SS \text{ between} + SS \text{ within} \\ = 128.55 + 290.99 = 419.54$$

ANOVA table for this problem was then set up. The data in the Table 4 tested the significance by using one-way ANOVA technique. The calculated value of F-ratio 3.31 is less than the F-table value 3.68 with 5% significance with d. f. (2, 15) and hence the null hypothesis is accepted. This shows the unequal use of library by engineering faculties in Karnataka. Therefore, the

frequency of visit to library is unequal among the engineering faculties.

Time spent in reading at various places by the engineering faculty

To find out the time spent in reading by the engineering faculty, hours/week is taken as a unit. The time spent in reading documents at various place by faculty of engineering colleges in Karnataka was presented in Tables 5, 6 and 7.

It is observed from Table 7 that, 60.43, 25.90 and 75.54% of professors spent less than 5 h weekly for reading at home, in department and in library, respectively. Further analysis shows that 24.46, 17.99 and 24.46% of professors spent 5 to 10 h weekly reading at home, in department and in library, respectively. Whereas, 15.10 and 56.11% of professors spent 11 to 20 h weekly for reading at home, department and library, respectively.

It is evident from Table 8 that 27.84, 15.98, 68.56 and 8.24% of assistant professors spent less than 5 h weekly for reading documents at home, in department, in library and at other places respectively. Further it is evident that 52.06, 27.84 and 31.44% of assistant professors spent 5 to 10 h per week reading at home, in department and in the library, respectively. Whereas 20.10 and 56.18% of assistant professors spent 11 to 20 h weekly reading at home and in department, respectively.

Table 9 shows that, 16.07, 13.90 and 45.80% of lecturer spend less than 5 h weekly for study at home, in department and in library. It is observed from Table 9 that, 41.97, 15.10, 27.82 and 5.99% of lectures spend 5 to 10 h weekly reading at home, in department, in library or at other place, respectively. Whereas 41.97, 47.96 and 26.38% of lecture spend 11 to 20 h weekly reading at home, in department and in library, respectively. 23.02% of lecturers spent more than 21 h weekly in department.

Table 6. ANOVA table for frequency of visit to library by engineering faculty.

Source of variation	Sum of squares (SS)	Degrees of freedom (d.f.)	Mean square (MS)	F – ratio	5% F-limit (from F-table)
Between samples	128.55	(k-1) (3-1)=2	$\frac{SS \text{ between}}{(k-1)}$ 128.55/2=64.27	$\frac{MS \text{ between}}{MS \text{ within}}$ 64.27/19.39 =3.31	F (2,15)=3.68
With in sample	290.99	(n-k) (18-3)= 15	$\frac{SS \text{ within}}{(n-k)}$ 290.99/15=19.39		3.31<3.68
Total	419.54	(n-1) (18-1)=17			

Table 7. Time spent in reading at various places by professors.

Place	Time spent			
	Less than 5 weekly	5 to 10 h weekly	11 to 20 h weekly	More than 21 h weekly
At home	84 (60.43)	34 (24.46)	21(15.10)	---
In department	36 (25.90)	25 (17.99)	78 (56.11)	---
In library	105 (75.54)	34 (24.46)	---	---
Any other	08(5.75)	--	--	--

Figures in parentheses show the percentage.

Table 8. Time spent in reading at various places by assistant professors.

Place	Time spent			
	Less than 5 h/week	5 to 10 h weekly	11 to 20 h weekly	More than 21 h weekly
At home	54 (27.84)	101 (52.06)	39 (20.10)	--
In department	31 (15.98)	54 (27.84)	109(56.18)	--
In library	133 (68.56)	61(31.44)	--	--
Any other	16 (8.24)	--	--	--

Figures in parentheses show the percentage.

Table 9. Time spent in reading at various places by lecturers.

Place	Time spent			
	Less than 5 h/week	5 to 10 h weekly	11 to 20 h weekly	More than 21 h weekly
At home	67 (16.07)	175 (41.97)	175(41.97)	--
In department	58 (13.90)	63 (15.10)	200 (47.96)	96 (23.02)
In library	191 (45.80)	116 (27.82)	110 (26.38)	--
Any other	--	25 (5.99)	--	--

Figures in parentheses show the percentage.

Use of library services by engineering faculty

It is observed from Table 10 that, among professors, 80.57% use 'reference service' and 58.99% use 'reprographic service'. Whereas 50.35 and 36.69% of professors use 'inter library loan' and

'newspaper clipping services'. 25.17 and 15.10% of professors use 'internet/ online services' and 'bibliographic database on CD-ROM', respectively. The table shows that, 69.58% of assistant professors use 'reference service' and 48.96% use 'reprographic services'. Further, it is observed that 44.32 and 25.77% of assistant

Table 10. Use of library services by engineering faculty.

Services	No. of engineering faculty cadre wise			
	Professor N=139	Assistant professor N=194	Lecturer N=417	Total N=750
Reference service	112 (80.57)	135 (69.58)	217 (52.03)	464 (61.86)
Bibliographic databases on CD/ROM	21 (15.10)	63 (32.47)	49 (11.75)	133 (17.73)
Internet/ online services	35 (25.17)	86 (44.32)	152 (36.45)	273 (36.4)
Inter library loan	70 (50.35)	36 (18.55)	44 (10.55)	150 (20.00)
Reprographic services	82 (58.99)	95 (48.96)	187 (44.84)	364(48.53)
News paper clipping services	51 (36.69)	50 (25.77)	64 (15.34)	165 (22.00)
Other	16 (11.51)	20 (10.30)	28 (6.71)	64 (8.53)

Figures in parentheses show the percentage

Table 11. Reduced figures of use of library services by engineering faculty.

Services	Professor	Assistant professor	Lecturer
Reference service	14.93	18	28.93
Bibliographic databases on CD/ROM	2.8	8.4	6.53
Internet/ Online Services	4.66	11.46	20.26
Inter library loan	9.33	4.8	5.86
Reprographic Services	10.93	12.66	24.93
News paper clipping services	6.8	6.66	8.53
Other	2.13	2.66	3.73
N=7, K=3			
Mean	$\bar{X}_1=51.58/7$ =7.36	$\bar{X}_2=64.64/7$ =9.23	$\bar{X}_3=98.77/7$ =14.11

professors use internet/online information services, respectively. Where as, 32.47 and 18.55% assistant professors use newspaper clipping and inter library loan services, respectively. 10.30% of assistant professors use other services.

The table revealed that among lecturers, 52.03% use 'reference service' and 44.84% use 'reprographic service' followed by 36.45% of lecturers use 'internet/online services'. Whereas 15.34 and 11.75% of lecturers uses 'news paper clipping' and 'bibliographic database on CD/ROM search services', respectively. Further it is found that, 10.55 and 6.71% of lecturers uses 'inter library loan' and other services, respectively. From the discussion, it is clear that 'reference service' was the highest used service among 61.86% teaching faculty of engineering colleges in Karnataka. 'Reprographic service' is the next important service used by 48.53% of engineering faculty. Usage of 'internet/online service' is seen among 36.53% of teaching faculty, thus occupying third position. This is followed by 'news paper clipping services' used by 23.73% of teaching faculty. Further it is observed that, 'inter library loan', 'bibliographic database on CD/ROM and other services are used by 20.00, 17.73 and 8.53% of engineering faculty, respectively.

Using ANOVA technique, the significance of use of library services by engineering faculty was tested; the following hypotheses are framed to Table 10.

Hypotheses

1. There is an unequal use of library services among the engineering faculties.

2. There is an equal use of library services among the engineering faculties.

Using coding method that is, all the n items values (Table 10) are divided by 750 and multiplied by 100 to reduce big figures in magnitude so computation work is simplified without any disturbance setting up Table 11.

$$\bar{X} = \frac{\bar{X}_1 + \bar{X}_2 + \bar{X}_3}{\text{No. of sample (k)}} = \frac{7.36+9.23+14.11}{3} = \frac{30.7}{3} = 10.23$$

$$\text{SS between} = n_1(\bar{X}_1 - \bar{X})^2 + n_2(\bar{X}_2 - \bar{X})^2 + \dots + n_k(\bar{X}_k - \bar{X})^2$$

$$\text{SS between samples} = 57.65+7+105.38 = 170.03$$

$$\text{SS with in samples} = \sum(X_{1i} - \bar{X}_1)^2 + \sum(X_{2i} - \bar{X}_2)^2 + \sum(X_{3i} - \bar{X}_3)^2, \quad i=1,2,3$$

$$\text{SS with in samples} = 129.66+163.70+638.90=932.26$$

$$\text{SS for total variance} = \sum(X_{ij} - \bar{X})^2 \quad i=1,2,3.. \quad j= 1,2,3\dots$$

$$\text{SS for total} = 932.26$$

SS for total variance can also be worked out;

$$\text{SS for total} = \text{SS between} + \text{SS within} \\ = 170.03+932.26=1102.29$$

Table 11. Reduced figures of use of library services by engineering faculty.

Services	Professor	Assistant professor	Lecturer
Reference service	14.93	18	28.93
Bibliographic databases on CD/ROM	2.8	8.4	6.53
Internet/ Online Services	4.66	11.46	20.26
Inter library loan	9.33	4.8	5.86
Reprographic Services	10.93	12.66	24.93
News paper clipping services	6.8	6.66	8.53
Other	2.13	2.66	3.73
N=7, K=3	$\bar{X}_1=51.58/7$	$\bar{X}_2=64.64/7$	$\bar{X}_3=98.77/7$
Mean	=7.36	=9.23	=14.11

Table 13. Faculty opinion about the engineering college library.

Opinion	Professor		Assistant professor		Lecturer		Total	
	Yes	No	Yes	No	Yes	No	Yes	No
Good and Inviting atmosphere in the Library	91 (65.47)	48 (34.53)	155 (78.90)	39 (21.10)	371 (89.97)	46 (11.03)	617 (82.27)	133 (17.73)
Getting reading material without loss of time	49 (35.25)	90 (64.75)	98 (50.51)	96 (49.48)	145 (34.77)	272(65.23)	292 (38.93)	458(61.07)
Satisfied with present lending system	102 (73.38)	37 (26.62)	148 (76.29)	46 (23.71)	325 (77.94)	92 (22.06)	575 (76.67)	175(23.33)
Satisfied with present working hours of library	102 (73.38)	37 (26.62)	136 (70.10)	58 (29.90)	237 (56.83)	180(43.17)	475(63.33)	275(36.67)
Satisfied with current subscription of journals	52 (37.41)	87 (62.59)	99 (51.03)	95 (48.97)	219 (52.52)	198(47.48)	370 (49.33)	380 (50.67)

Figures in parentheses show the percentage.

One-way ANOVA table is then set up for this problem. The data in Table 12 tested the significance by using ANOVA technique. The calculated value of F-ratio 1.64 is less than the F-table value 3.55 with 5% significance with d. f. (2, 18) and hence could have arisen due to chance. The null hypothesis of unequal is accepted. Therefore, there is an unequal use of library services among the engineering faculties.

Faculty opinion about the engineering college library

The engineering college library is a special library as it caters to the information needs of the teachers who are

actively engaged in creative work. It is the heart of the institute, which should function in a well coordinated manner for effective library services. Table 13 shows how the engineering college faculty rates the college library service. It is observed from Table 13 that, among professors 65.47% of them having affirmative opinion and 34.53% of them have made negative opinion about 'good and inviting atmosphere in the library'. Secondly, for 'getting reading material without loss of time' for this question 64.75% of professors showed negative opinion and 35.25% of professors are of positive opinion. For the third question, whether they are 'satisfied with the present landing system', among professors, 73.38% of them are having positive opinion and 26.62% of them have made

negative opinion. For the fourth question, 'working hours of library' 73.38% of professors feel that it is satisfactory and convenient and 26.62% of them were not satisfied and feel it is inconvenient. For the last question, 'current subscription of journals' in their field, 62.59% of professors are not satisfied and 37.41% of them are satisfied with the current subscription of journals. It is further observed from Table 13 that, among assistant professors, 78.90% of them having affirmative opinion and 21.10% of them made negative opinion about 'good and inviting atmosphere in the library'. Secondly, for getting reading material without loss of time' for this question, 50.51% of assistant professors showed positive opinion and 49.48% of assistant professors are of the negative opinion. For the third

question, whether they are 'satisfied with the present lending system', among assistant professors 76.29% of them had positive opinion and 23.71% had negative opinion. For the fourth question 'working hours of library', 70.10% of assistant professors feel that it is satisfactory and convenient and 29.90% of them are not satisfied and feel it is inconvenient. For the last question about 'current subscription of journals' in their field, 51.03% of assistant professors are satisfied and 48.97% of them are not satisfied with the current subscription of journals.

Table 13 reveals that, among lecturers, 89.97% of them had affirmative opinion and 11.03% of them had negative opinion about 'good and inviting atmosphere in the library'. Secondly for 'getting reading material without loss of time' for this question 65.23% of lecturers had negative opinion and 34.77% of lecturers are of the positive opinion. For the third question, whether they are 'satisfied with the present lending system', among lecturers, 77.94% had positive opinion and 22.06% of them had negative opinion. For the fourth question 'working hours of library', 56.83% of lecturers feel that it is satisfactory and convenient and 43.17% of them were not satisfied and feel it is inconvenient. For the last question about 'current subscription of journals' in their field, 52.52% of lecturers were satisfied and 47.48% of them were not satisfied with the current subscription of journals.

Table 13 reveals that majority of teaching faculty of engineering colleges in Karnataka are satisfied with the good atmosphere, present lending system and working hours of the library, but they are not satisfied with the system of getting the reading materials and current subscription of journals in the library.

FINDINGS OF THE STUDY

It is found from the study that

1. 53.20% of all the users use catalogue/OPAC for locating the required reading materials.
2. 48.80% of users consult the librarian and library staff for locating the reading materials.
3. It 28.4% of all users visit the library once weekly, 27.47% visit the library twice weekly
4. 75.54% of all the users are spend less then 5 h weekly in their libraries, 24.46% each were spend 50 to 10 h weekly at home and in their libraries
5. 61.86% of users use reference services, 48.53% users use internet services.

6. 61.07% of all the users are of the opinion that they are getting reading materials without any loss of time.

7. 50.67% of all the users were satisfied with the subscription of current periodicals.

8. 36.67% of all the users were satisfied with the present working hours

Conclusion

The following conclusions are drawn from this study in relation with the framed hypotheses

1. The frequency of use of information source is not the same among professors, assistant professors and Lecturers.
2. All the access tools used for locating reading materials among engineering faculties are alike.
3. There is a positive correlation among professors, assistant professors and lecturers regarding the usefulness of information sources.
4. There is an unequal use of library services among the engineering faculties.
5. The frequency of visit to library is unequal among the engineering faculties

REFERENCES

- Achintya A, Mishra SS (2000). Quality assurance in engineering education. *Ind. J. Tech. Educ.*, 23: 1-80.
- Raja K, Ratnam V (2007). Engineering education in India- Quality concerns and remedial measures. *Ind. J. Tech. Educ.*, 30(3): 73-90.
- Saravan AM (2005). Multifunction approach for the technical teachers in the new millennium. *Ind. J. Tech. Educ.*, 28(3): 84-88.
- Sharma SC (2001). Status of engineering college libraries in Haryana: A survey. *ILA Bull.*, 37(3): 101-106.