
Information Literacy Skills and Competencies of Faculty Members of Engineering Colleges in Bengaluru City: A Study

Girijamba B M

Research Scholar,
Department of Library and Information Science,
University of Mysore, Mysuru-570006,
e-mail: girijamba.bm@gmail.com

Mallinath Kumbar

Former Professor,
Department of Library and Information Science,
University of Mysore, Mysuru-570006,
e-mail: mallinathkumbar@gmail.com

Abstract

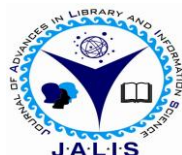
The present study assessed the information literacy skills and competencies of faculty members of engineering colleges in Bengaluru City through a descriptive survey covering five engineering disciplines across VTU-affiliated colleges. Data were collected using a structured questionnaire and analysed using descriptive and inferential statistical techniques. The findings revealed that a substantial majority of faculty members (91.15%) reported possessing the required skills and competencies to identify information sources. Among printed information sources, books were the most widely used (92.19%), while e-journals were the most widely used electronic resource (90.05%). Advanced Search was the most preferred Web-OPAC search option (64.51%), while the OR Boolean operator was the most frequently used (46.00%). Awareness of the Copyright Act was high among the respondents (95.61%). The findings highlight the need for targeted and periodic information literacy initiatives to strengthen advanced information-search, retrieval and evaluation skills among engineering faculty.

Keywords

Information Literacy; Information literacy skills;
information literacy Competencies; engineering
colleges

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1. Introduction

Information literacy has become an essential competency for faculty members in higher education, particularly in engineering institutions where rapid developments in science, technology, and digital information have transformed the ways in which academic information is accessed, evaluated, and utilized. The increasing availability of printed and electronic information resources, online databases, e-journals, e-books, Web-OPACs, search engines, and virtual resources has created both opportunities and challenges for effective information retrieval. Faculty members require adequate skills to identify appropriate information sources, formulate effective search strategies, retrieve relevant information, and evaluate its reliability and relevance for teaching, research, and academic activities. In addition, awareness of copyright, fair use, plagiarism, and responsible use of information is essential for ethical scholarly communication. Computer and web literacy skills further influence the effective utilization of information resources in the digital environment. Engineering faculty members work across diverse disciplines, and their information needs, search behavior, resource preferences, and levels of technological competency may therefore vary considerably. Understanding these variations is important for developing effective library services and information literacy programmes.

2. Review of Literature

Many similar studies on the topic have been reviewed, and the literature review provides a broader perspective. Some of the important reviews are presented below. Baikady and Mudhol (2013) carried out a study on Computer Literacy and the use of web resources among the medical faculty and students. The study revealed that almost all the respondents possessed basic computer literacy skills. The faculty and PG students with above-average computer literacy used web resources less frequently. Faculty members and postgraduate students with below-average computer skills did not access web resources frequently. Ramamurthy, et al (2015) investigated the knowledge of information literacy and search skills of students in five selected Engineering Colleges in Chittoor District, Andhra Pradesh. It was found that the preponderance of respondents have low knowledge of information literacy skills, showing a high deficiency in identifying diverse information sources. The various information literacy programmes for the respondents in institutions lacked hands-on

training. Thus, the need for enhanced, continuous library user education geared towards empowering students to become sufficiently familiar with information sources.

Deepmala and Shivraj's (2016) study examines information literacy skills among 96 women faculty members in 27 engineering colleges in Coimbatore and finds a rise in the use of social media for knowledge sharing. Kiran Kumar and Kumbar (2015) conducted a study of autonomous engineering institutions affiliated to Visvesvaraya Technological University in Karnataka to examine the factors affecting the optimal utilisation of electronic information resources and search patterns. The study mainly focused on the use of different types of electronic information resources by the faculty, source of awareness, learn to use, problems faced, purpose of use, preferred search engines and search methods for effective retrieval of electronic information resources. Thirmagal and Mani (2016) examined the information literacy skills among faculty members of engineering colleges in Tirunelveli district, Tamil Nadu. The majority of faculty members need academic information and find it on the internet/web. The faculty members are in need of an information literacy training programme to become lifelong learners.

3. Objectives of the Study

The objectives behind conducting the present study are:

1. To examine the information literacy skills among faculty members in identifying information sources
2. To find out the need for information in both print and electronic formats by faculty members.
3. To find out the methods of searching the library catalogue and preferred options in the web- opac by faculty members of engineering colleges in Bengaluru city.
4. To know the awareness and knowledge of copyright Act among faculty members of engineering colleges.
5. To identify the difficulties encountered by faculty members while accessing print information resources.
6. To obtain the opinion of the faculty members towards the need for a training programme on information literacy.

4. Methodology

The present study adopted a descriptive survey research design to examine the information literacy skills and competencies of faculty members in selected engineering colleges in Bengaluru City. The study covered Civil, Mechanical, Electronics and Communication, Computer Science and Biotechnology Engineering branches. Convenience sampling was adopted due to the accessibility of faculty members and their willingness to participate. At the time of the study, there were 43 VTU-affiliated engineering colleges in Bengaluru City. All these 43 colleges were selected for the investigation. A total of 1,948 questionnaires were distributed, of which 1,639 valid responses were received, yielding a response rate of 84.13 per cent. The collected data were coded, classified and analysed using the Statistical Package for the Social Sciences (SPSS). The findings were presented using tables, charts and figures to facilitate systematic interpretation. Descriptive statistics included frequency, percentage, mean, standard deviation, weighted mean, coefficient of variation and ranking. Chi-square test and Cramer's V were employed for inferential.

5. Data Analysis

The data were collected using different methods, analysed and interpreted, and are presented in the following tables.

Table 1: Distribution of Questionnaires

Sl No	Branch	Population	Questionnaire	
			Distributed	Received
1	Civil Engg.	320	279 (87.19)	251 (78.44)
2	Mech. Engg.	470	406 (86.38)	338 (71.91)
3	E and C. Engg.	670	589 (87.91)	464 (69.25)
4	Comp. Sci. Engg.	710	621 (87.46)	542 (76.34)
5	Biotech. Engg.	60	53 (88.33)	44 (77.33)
	Total	2230	1948 (87.35)	1639 (73.50)

Note. Figures in parentheses indicate percentage

Table 1 shows the branch-wise distribution of questionnaires among the selected engineering disciplines. Overall, questionnaires were distributed to 87.35 per cent of the study population, and 73.50 per

cent of the total population participated in the study by returning completed questionnaires. The distribution of questionnaires was almost uniform across all the selected branches, varying only between 86.38 per cent and 88.33 per cent. Similarly, the response rate ranged from 69.25 per cent to 78.44 per cent. Civil Engineering recorded the highest response rate (78.44%), whereas Electronics and Communication Engineering reported the lowest (69.25%).

The consistent distribution and satisfactory response rates across all the selected engineering disciplines indicate that the data collection process was well balanced and that adequate representation was obtained from each branch. This provides a reliable basis for analysing the information literacy skills and competencies of faculty members in the selected engineering colleges.

Table 2: Gender wise Distribution of Faculty Members

Gender	Branches of Engineering					Total (n=1639)
	Civil (n=251)	Mechanical (n=338)	Ele. & Com. (n=464)	Comp. Sci. (n=542)	Biotech. (n=44)	
Male	168 (66.93)	282 (83.43)	183 (39.44)	240 (44.28)	16 (36.36)	889 (54.24)
Female	83 (33.07)	56 (16.57)	281 (60.56)	302 (55.72)	28 (63.64)	750 (45.76)

Note. Figures in parentheses indicate percentage

Table 2 exhibits the gender-wise distribution of faculty members across the selected engineering disciplines. The distribution of male and female faculty members varied considerably among the branches. Male faculty members formed the majority in Mechanical Engineering (83.43%) and Civil Engineering (66.93%). In contrast, female faculty members outnumbered male faculty members in Electronics and Communication Engineering (60.56%), Computer Science Engineering (55.72%), and Biotechnology Engineering (63.64%).

The findings indicate that the gender composition differs across the selected engineering disciplines. While traditional branches such as Civil and Mechanical Engineering continue to have higher male representation, Electronics and Communication Engineering, Computer Science Engineering, and Biotechnology Engineering exhibit greater female faculty participation. This branch-wise diversity ensures that the study incorporates perspectives from both male and female faculty members across different engineering disciplines.

Table 3: Conduct of Library Orientation Programmes

Variable	Branches of Engineering					Total (n=1639)
	Civil (n=251)	Mechanical (n=338)	Ele. & Com. (n=464)	Comp. Sci. (n=542)	Biotech. (n=44)	
Yes	243(96.81)	321(94.97)	445(95.91)	481(88.75)	39(88.64)	1529(93.29)
No	08 (03.19)	17 (05.03)	19 (04.09)	61 (11.25)	05 (11.36)	110 (06.71)

Note. Figures in parentheses indicate percentage

Table 3 explains the conduct of library orientation programmes across the selected engineering disciplines. A very high proportion of faculty members reported the conduct of such programmes in all branches, with the highest proportion in Civil

Engineering (96.81%), followed by Electronics and Communication Engineering (95.91%) and

Mechanical Engineering (94.97%). Comparatively lower proportions were observed in Computer Science Engineering (88.75%) and Biotechnology Engineering (88.64%). The chi-square test revealed a statistically

significant association between branch of engineering and the conduct of library orientation programmes, $\chi^2(4, N = 1639) = 30.97, p < .001$, Cramer's $V = .14$, indicating a weak association. Post hoc analysis using adjusted standardized residuals with Bonferroni correction showed that Computer Science Engineering faculty members reported "Yes" significantly less

often than expected ($ASR = -5.17$), while Electronics and Communication Engineering faculty members reported "Yes" more often than expected ($ASR = 2.66$). Overall, although library orientation programmes were widely conducted across all branches, some disciplinary variation was evident, particularly in Computer Science Engineering.

Table 4 : Skills and Competencies in Identifying Information Sources

Branches of Engineering						
Response	Civil (n=251)	Mechanical (n=338)	Ele. & Com. (n=464)	Comp. Sci. (n=542)	Biotech. (n=44)	Total (N=1639)
Yes	218 (86.85)	296 (87.57)	424 (91.38)	518 (95.57)	38 (86.36)	1494 (91.15)
No	33 (13.15)	42 (12.43)	40 (8.62)	24 (4.43)	06 (13.64)	145 (8.85)
$\chi^2=25.53, df=04, p < .001$ Cramer's $V = .12$						

F

Figures in parentheses indicate percentages.

Table 4 quantifies faculty members' skills and competencies in identifying information sources across the selected engineering disciplines. A high proportion of faculty members in all branches reported possessing the required skills and competencies, with the highest proportion in Computer Science Engineering (95.57%), followed by Electronics and Communication Engineering (91.38%). Comparatively lower, though still substantial,

proportions were observed in Biotechnology (86.36%), Civil (86.85%), and Mechanical Engineering (87.57%). The chi-square test revealed a statistically significant association between branch of engineering and skills and competencies in identifying information sources $\chi^2(4, N = 1639) = 25.53, p < .001$, Cramér's $V = .12$, indicating a weak association, showing that the reported skills and competencies vary significantly across engineering disciplines.

Table 5: Types of Information Sources Used to Satisfy Information Needs

Printed Sources	Civil Engg (N=251)	Mech. Engg (N=338)	Elect. Engg. (N=464)	Comp. Sci. Engg. (N=542)	Biotech. Engg. (N=44)	Total (N=1639)	Mean	SD
Printed Sources								
Books	246 (98.01)	311 (92.01)	416 (89.66)	502 (92.62)	36 (81.82)	1511 (92.19)	2.848445	1.123214
Journals	174 (69.32)	261 (77.22)	345 (74.35)	398 (73.43)	30 (68.18)	1208 (73.70)	2.875000	1.097908
Back Volumes of Periodicals	76 (30.28)	54 (15.98)	63 (13.58)	39 (7.20)	8 (18.18)	240 (14.64)	2.370833	1.179682
Reference Sources	162 (64.54)	212 (62.72)	314 (67.67)	437 (80.63)	26 (59.09)	1151 (70.23)	2.959166	1.102513
Standards and Specification	105 (41.83)	89 (26.33)	102 (21.98)	98 (18.08)	13 (29.55)	407 (24.83)	2.570025	1.197617
Technical Reports	191 (76.10)	284 (84.02)	361 (77.80)	320 (59.04)	36 (81.82)	1192 (72.73)	2.770134	1.102551
Patents	62	88	172	168	31	521	3.034545	1.097352

	(24.70)	(26.04)	(37.07)	(31.00)	(70.45)	(31.79)		
Government Publication	107 (42.63)	119 (35.21)	204 (43.97)	311 (57.38)	12 (27.27)	753 (45.94)	3.002656	1.096896
$\chi^2=198.063$, $df=28$, $P= 0.000$								
Electronic Sources								
Electronic Sources	Civil Engg (N=251)	Mech. Engg (N=338)	Elect. Engg. (N=464)	Comp. Sci. Engg (N=542)	Biotech. Engg (N=44)	Total (N=1639)	Mean	SD
E-Books	142 (56.57)	294 (86.98)	412 (88.79)	506 (93.36)	37 (84.09)	1391 (84.87)	3.001438	1.043964
E-Journals	201 (80.08)	286 (84.62)	432 (93.10)	518 (95.57)	39 (88.64)	1476 (90.05)	2.937669	1.091438
E-Reference Sources	186 (74.10)	149 (44.08)	406 (87.50)	492 (90.77)	35 (79.55)	1268 (77.36)	3.032334	1.096192
Consortia –VTU	204 (81.27)	287 (84.91)	395 (85.13)	384 (70.85)	29 (65.91)	1299 (79.26)	2.805235	1.093660
Online Databases	199 (79.28)	264 (78.11)	272 (58.62)	375 (69.19)	26 (59.09)	1136 (69.31)	2.793134	1.145408
Online Virtual Resources	168 (66.93)	252 (74.56)	241 (51.94)	364 (67.16)	33 (75.00)	1058 (64.55)	2.850662	1.148845
Audio-Visual Material	152 (60.56)	235 (69.53)	389 (83.84)	380 (70.11)	08 (18.18)	1164 (71.02)	2.877148	1.031061
Online Technical Reports	96 (38.25)	103 (30.47)	84 (18.10)	116 (21.40)	04 (09.09)	403 (24.59)	2.575682	1.164446
Note: Figures in parentheses indicate percentage and because of multiple choice options the percentage is exceeded to more than 100%.								
$\chi^2=210.418$, $df=28$, $P= 0.000$								

Table-5 summarizes the branch-wise use of printed and electronic information sources to satisfy the information needs of engineering college faculty members. 1511 (92.19%) of members of faculty are satisfied with information needs using books with Mean 2.848445 and SD 1.123214, followed by 1208 (73.70%) of members of faculty are satisfied with information needs using journals with Mean 2.875000 and SD 1.097908, 1192 (72.73%) of members of faculty are satisfied with information needs using technical reports with Mean 2.770134 and SD 1.102551, 1151 (70.23%) of members of faculty are satisfied with information needs using reference resources with Mean 2.959166 and SD 1.102513, 753 (45.90%) of members of faculty are satisfied with information needs using government publications with Mean 3.002656 and SD 1.096896, 521 (31.79%) of members of faculty are satisfied with information needs using patents with Mean 3.064549 and SD 1.097352, 407 (24.83%) of members of faculty are satisfied with information needs using standards and specification with Mean 2.570025 and SD 1.197617, 240 (14.64%) of members of faculty are satisfied with

information needs using back volumes of periodicals with Mean 2.370833 and SD 1.179682.

The branch-wise use of electronic information sources to satisfy the information needs of engineering college faculty members.1476 (90.05%) of members of faculty are satisfied with information needs using e-journals with Mean 2.937669 and SD 1.091438, followed by 1391 (84.87%) of members of faculty are satisfied with information needs using e-books with Mean 3.001438 and SD 1.043964, 1299 (79.26%) of members of faculty are satisfied with information needs using Consortia-VTU with Mean 2.805235 and SD 1.093660, 1268 (77.36%) of members of faculty are satisfied with information needs using e-reference resources with Mean 3.032334 and SD 1.096192, 1164 (71.02%) of members of faculty are satisfied with information needs using Audio-Visual materials with Mean 2.877148 and SD 1.031061, 1136 (69.31%) of members of faculty are satisfied with information needs using online databases with Mean 2.793134 and SD 1.145408, 1058 (64.55%) of members of faculty are satisfied with information needs using online virtual resources with Mean

2.850062 and SD 1.148849, 403 (24.59%) of members of faculty are satisfied with information

needs using online technical report with Mean 2.575682 and SD 1.164446.

Table 6: Methods Used for Searching the Library Catalogue

Search Method	Branches of Engineering					
	Civil (n=86)	Mech. (n=106)	Ele. & Com. (n=81)	Comp. Sci. (n=62)	Biotech. (n=12)	Total (n=347)
By author	51 (59.30)	66 (62.26)	39 (48.15)	21 (33.87)	02 (16.67)	179 (51.59)
By title	20 (23.26)	19 (17.92)	16 (19.75)	29 (46.77)	04 (33.33)	88 (25.36)
By Subject	15 (17.44)	21 (19.81)	26 (32.10)	12 (19.35)	06 (50.00)	80 (23.05)

Table 6 presents the methods used by faculty members to search a library catalogue. Author search was the most common method among Civil (59.30%) and Mechanical Engineering (62.26%) faculty members, whereas title search was comparatively prominent among Computer Science Engineering faculty members (46.77%). Subject search was highest among Biotechnology Engineering faculty members

(50.00%), followed by Electronics and Communication Engineering (32.10%). The chi-square test revealed a statistically significant association between branch of engineering and catalogue search method, $\chi^2(8, n = 347) = 33.79, p < .001$, Cramér's $V = .22$, indicating a moderate association. Thus, the preferred methods of searching a library catalogue differed significantly across engineering disciplines

Table 7: Preferred Search Options in the Web-OPAC

Search Option	Branches of Engineering					
	Civil (n=162)	Mech. (n=209)	Ele. & Com. (n=301)	Comp. Sci. (n=406)	Biotech. (n=21)	Total (n=1099)
Basic Search	105 (64.81)	142 (67.94)	222 (73.75)	128 (31.53)	14 (66.67)	638 (55.60)
Advanced Search	74 (45.68)	151 (72.25)	162 (53.82)	304 (74.88)	18 (85.71)	709 (64.51)
Expert Search	26 (16.05)	18 (08.61)	22 (07.31)	70 (17.24)	09 (42.86)	145 (13.19)

Note. Figures in parentheses indicate percentage and because of multiple choice options the percentage is exceeded to more than 100%.

Table 7 presents the preferred search options used by faculty members while searching the Web-OPAC. Advanced Search was the most preferred option overall (64.51%), followed by Basic Search (55.60%), whereas Expert Search (13.19%) was the least preferred. Advanced Search was most frequently used by Biotechnology Engineering (85.71%), Computer Science Engineering (74.88%), and Mechanical Engineering (72.25%) faculty members. Basic Search was more commonly preferred by Electronics and

Communication Engineering faculty members (73.75%), while comparatively lower use was observed among Computer Science Engineering faculty members (31.53%). Expert Search was used by a relatively small proportion of faculty members across all branches, with the highest use reported by Biotechnology Engineering (42.86%), followed by Computer Science Engineering (17.24%) and Civil Engineering (16.05%). Overall, the findings indicate that faculty members predominantly prefer Advanced

Search and Basic Search options in Web-OPAC, while respondents.
 Expert Search is used only by a limited number of

Table 8: Boolean Operators Used in Searching More Documents

Boolean Operators	Civil Engg. (N=251)	Mech. Engg. (N=338)	E and C Engg. (N=464)	Comp. Sci. Engg. (N=542)	Biotech. Engg (N=44)	Total (N=1639)	Mean	SD
And	153 (60.96)	146 (43.20)	177 (38.15)	126 (23.25)	11 (25.00)	613 (37.40)	2.504078	1.126023
Or	25 (09.96)	119 (35.21)	206 (44.40)	384 (70.85)	20 (45.45)	754 (46.00)	3.338196	0.889640
Not	11 (04.38)	22 (06.51)	18 (03.88)	06 (01.11)	08 (18.18)	65 (03.97)	2.661538	1.218788
Don't Know	62 (24.70)	51 (15.09)	63 (13.58)	26 (04.80)	05 (11.36)	207 (12.63)	2.328502	1.102614
$\chi^2=320.13$, $df=12$, $P= 0.000$.								

Note. Figures in parentheses indicate percentage

The information relating to the Boolean operators used by faculty members for retrieving a greater number of documents is summarized in Table 8. The findings reveal that the 'OR' Boolean operator was the most frequently used, with 754 (46.00%) respondents reporting its use. This category recorded a mean score of 3.338 (SD = 0.890). The 'AND' Boolean operator was the second most preferred, utilized by 613 (37.40%) respondents, with a mean score of 2.504 (SD = 1.126). A considerable proportion of respondents (207; 12.63%) indicated that they did not know which Boolean operator should be used to retrieve more documents, with a mean score of

2.329 (SD = 1.103). In contrast, only 65 (3.97%) respondents reported using the 'NOT' Boolean operator, which recorded a mean score of 2.662 (SD = 1.219). These findings suggest that faculty members predominantly employ the 'OR' Boolean operator to broaden their search results and retrieve a larger number of relevant documents. The comparatively lower use of the 'AND' and 'NOT' operators, together with the proportion of respondents unfamiliar with Boolean search techniques, indicates that advanced search strategies are not uniformly practiced among the respondents.

Table 9: Awareness of Copyright Act

Awareness	Civil Engg. (N=251)	Mech. Engg. (N=338)	E and C Engg. (N=464)	Comp. Sci. Engg. (N=542)	Biotech. Engg (N=44)	Total (N=1639)	Mean	SD
Yes	236 (94.02)	321 (94.97)	429 (92.46)	538 (99.26)	43 (97.73)	1567 (95.61)	2.892151	1.117470
No	15 (05.98)	17 (05.03)	35 (07.54)	04 (00.74)	01 (02.27)	72 (04.39)	2.430556	0.925359
$\chi^2=30.497$, $df=04$, $P= 0.000$.								

Note. Figures in parentheses indicate percentage

The information relating to the awareness of the Copyright Act among faculty members is summarized in Table 9. The findings reveal that a substantial majority of the respondents (1,567; 95.61%) reported that they were aware of the Copyright Act, with a mean score of 2.892 (SD =

1.117). In contrast, only 72 (4.39%) respondents indicated that they were not aware of the Copyright Act, recording a mean score of 2.431 (SD = 0.925).

These findings indicate a high level of awareness regarding copyright provisions among faculty members.

A discipline-wise analysis further indicates that awareness of the Copyright Act was consistently high across all engineering disciplines. The highest proportion of respondents reporting awareness was observed in Computer Science Engineering (538; 99.26%), followed by Biotechnology Engineering (43; 97.73%), Mechanical Engineering (321; 94.97%), Civil Engineering (236; 94.02%), and Electronics and Communication Engineering (429;

92.46%). Conversely, only a small proportion of respondents from each discipline reported that they were not aware of the Copyright Act, including 35 (7.54%) from Electronics and Communication Engineering, 17 (5.03%) from Mechanical Engineering, 15 (5.98%) from Civil Engineering, 4 (0.74%) from Computer Science Engineering, and 1 (2.27%) from Biotechnology Engineering. The findings demonstrate that awareness of the Copyright Act is widespread among faculty members across all engineering disciplines, with only a negligible proportion of respondents indicating a lack of awareness.

Table 10 Difficulties Faced in Accessing Required Information from Print Sources

Printed Sources								
Problems Faced	Civil Engg. (N=251)	Mech. Engg. (N=338)	E and C Engg. (N=464)	Comp. Sci. Engg. (N=542)	Biotech. Engg. (N=44)	Total (N=1639)	Mean	SD
Yes	52 (20.72)	79 (23.37)	101 (21.77)	59 (10.89)	21 (47.73)	312 (19.04)	2.737179	1.144172
No	199 (79.28)	259 (76.63)	363 (78.23)	483 (89.11)	23 (52.27)	1327 (80.96)	2.903542	1.104097
$\chi^2=53.692, df=04, P= 0.000$								
Types of Problems Faced	Civil Engg. (N=52)	Mech. Engg. (N=79)	E&C Engg. (N=101)	Comp. Sci. Engg. (N=59)	Biotech. Engg. (N=21)	Total (N=312)	Mean	SD
Lack of knowledge about use of library catalogue	21 (40.38)	26 (32.91)	32 (31.68)	22 (37.28)	11 (52.38)	112 (35.89)	2.785714	1.235115
Lack of Knowledge about use of OPAC/Web-OPAC	39 (75.00)	35 (44.30)	21 (20.79)	07 (11.86)	05 (23.80)	107 (34.29)	2.102804	1.110145
Lack of knowledge	10 (19.23)	12 (15.18)	19 (18.81)	14 (23.72)	03 (14.28)	58 (18.58)	2.793103	1.141062
Lack of Assistance from library staff	23(44.23)	33(41.77)	25(24.75)	46(77.96)	17(80.95)	144(46.15)	3.006944	1.288283
$\chi^2=47.124, df=12, P= 0.000$								

Note. Figures in parentheses indicate percentage and because of multiple choice options the percentage is exceeded to more than 100%.

The information gathered regarding the difficulties faced by members of faculty while accessing the required information from print sources is presented in Table 10. The findings reveal that 312 (19.04%) members of faculty reported that they faced difficulties in accessing the required information from print sources, with a mean score of 2.74 and a

standard deviation of 1.44. In contrast, 1,327 (80.96%) members of faculty indicated that they did not face any difficulties in accessing the required information from print sources, with a mean score of 2.90 and a standard deviation of 1.10.

Table 10 further shows the branch-wise distribution of responses. Among the respondents, 52 (20.72%) faculty members from Civil Engineering, 79 (23.37%) from Mechanical Engineering, 101 (21.77%) from Electronics and Communication Engineering, 59 (10.89%) from Computer Science Engineering, and 21 (47.73%) from Biotechnology Engineering reported that they faced difficulties in accessing the required information from print sources. On the other hand, 199 (79.28%) faculty members from Civil Engineering, 259 (76.63%) from Mechanical Engineering, 363 (78.23%) from Electronics and Communication Engineering, 483 (89.11%) from Computer Science Engineering, and 23 (52.27%) from Biotechnology Engineering stated that they did not encounter any difficulties while accessing the required information from print sources.

The findings indicate that a substantial majority of faculty members across all branches were able to access the required information from print sources without difficulty. However, Biotechnology Engineering faculty reported the highest proportion of

difficulties (47.73%) compared to the other engineering branches, whereas Computer Science Engineering faculty reported the lowest proportion (10.89%).

The Chi-square (χ^2) test conducted with 4 degrees of freedom at the 5% level of significance revealed a statistically significant association between the difficulties faced while accessing the required information from print sources and the disciplines of the faculty members ($\chi^2 = 53.692$, $p < 0.05$). Indicating that the difficulties encountered while accessing print sources are significantly associated with the respondents' disciplines. Further, the Chi-square (χ^2) test conducted with 12 degrees of freedom at the 5% level of significance also revealed a statistically significant association between the types of difficulties faced while accessing print sources and the disciplines of the faculty members ($\chi^2 = 47.124$, $p < 0.05$).

Table 11: Need for Information Literacy Training

Opinion	Civil Engg. (N=251)	Mech. Engg. (N=338)	E and C Engg. (N=464)	Comp. Sci. Engg. (N=542)	Biotech. Engg (N=44)	Total (N=1639)	Mean	SD
Yes	94 (37.45)	86 (25.44)	109 (23.49)	26 (04.80)	08 (18.18)	323 (19.71)	2.281734	1.045945
No	157 (62.55)	252 (74.56)	355 (76.51)	516 (95.20)	36 (81.82)	1316 (80.29)	3.016717	1.081635
			$\chi^2=137.38$, $df=4$, $P= 0.000$					

Note. Figures in parentheses indicate percentage

The branch-wise analysis presented in Table 11 shows that 94 (37.45%) faculty members from Civil Engineering, 86 (25.44%) from Mechanical Engineering, 109 (23.49%) from Electronics and Communication Engineering, 26 (4.80%) from Computer Science Engineering, and 8 (18.18%) from Biotechnology Engineering expressed the need for training/education in information literacy to facilitate the identification and retrieval of information. On the other hand, 157 (62.55%) faculty members from Civil Engineering, 252 (74.56%) from Mechanical Engineering, 355 (76.51%) from Electronics and Communication Engineering, 516 (95.20%) from Computer Science Engineering, and 36 (81.82%) from Biotechnology Engineering reported that they did not require such training.

The Chi-square (χ^2) test, with 4 degrees of freedom and the 5% significance level, revealed a statistically significant association between the need for training/education in information literacy to facilitate the identification and retrieval of information and the faculty members' disciplines ($\chi^2 = 137.38$, $p < 0.05$). Therefore, it is indicating that the need for information literacy training varies significantly across the different engineering disciplines.

Table 12: Self-rating of Computer Skills

Working With	N=1639			
	Excellent	Good	Fair	Not Good
Word Processing Application	760 (46.37)	574 (35.02)	202 (12.32)	103 (06.28)

Spreadsheet applications	603 (36.79)	191 (11.65)	661 (40.33)	184 (11.23)
Database applications	714 (43.56)	307 (18.73)	209 (12.75)	409 (24.95)
Presentation applications	911 (55.58)	413 (25.20)	232 (14.15)	83 (05.06)
Multimedia applications	643 (39.23)	347 (21.17)	507 (30.93)	142 (08.66)
Web design applications	608 (37.10)	246 (15.01)	438 (26.72)	347 (21.17)
Programming language	592 (36.12)	203 (12.39)	608 (37.10)	236 (14.40)
Web search engines	862 (52.59)	402 (24.53)	87 (05.31)	288 (17.57)
Communication application	366 (22.33)	208 (12.69)	804 (49.05)	261 (15.92)
$\chi^2=2314.933$, $df=24$, $P= 0.000$				

Note. Figures in parentheses indicate percentage.

The information relating to the rating of computer skills among the members of faculty has been presented in Table 12. The findings indicate that 760 (46.37%) faculty members rated their word processing application skills as 'Excellent', followed by 574 (35.02%) as 'Good', 202 (12.32%) as 'Fair', and 103 (6.28%) as 'Not Good'. With regard to spreadsheet application skills, 661 (40.33%) faculty members rated their skills as 'Fair', followed by 603 (36.79%) as 'Excellent', 191 (11.65%) as 'Good', and 184 (11.23%) as 'Not Good'.

Table 13: Preferred Search Engines

Preferred Search Engine	Civil Engg. (N=251)	Mech. Engg. (N=338)	E and C Engg. (N=464)	Comp. Sci. Engg (N=542)	Biotech. Engg (N=44)	Total (N=1639)	Mean	SD
Google	214 (85.26)	331 (97.93)	456 (98.28)	491 (90.59)	39 (88.64)	1531 (93.41)	2.875898	1.087432
Yahoo	103 (41.04)	98 (28.99)	123 (26.51)	262 (48.34)	22 (50.00)	608 (37.10)	3.003289	1.189312
Dog pile	14 (05.58)	29 (08.58)	108 (23.28)	306 (56.46)	19 (43.18)	476 (29.04)	3.602941	0.785846
Bing	98 (39.04)	102 (30.18)	201 (43.32)	314 (57.93)	06 (13.64)	721 (43.99)	3.038835	1.073520
Yippy Search	19 (07.57)	46 (13.61)	92 (19.83)	182 (33.58)	02 (04.55)	341 (20.81)	3.299120	0.908561
Others	02 (00.80)	01 (00.30)	03 (00.65)	06 (01.11)	04 (09.09)	16 (00.98)	3.562500	1.273222
$\chi^2=297.505$, $df=20$, $P= 0.000$								

Note. Figures in parentheses indicate percentage and because of multiple choice options the percentage is exceeded to more than 100%.

The information gathered on the preferred search engines used by the members of faculty for accessing web resources is presented in Table 113. The findings reveal that Google is the most preferred search engine, with 1531 (93.41%) members of faculty reporting its use (Mean = 2.875898, SD = 1.087432). This is followed by Bing, preferred by 721 (43.99%) respondents (Mean = 3.038835, SD = 1.073520), Yahoo, preferred by 608 (37.10%) respondents (Mean = 3.003289, SD = 1.189312), Dogpile, preferred by 476 (29.04%) respondents (Mean = 3.602941, SD = 0.785846) and Yippy Search, preferred by 341 (20.81%) respondents (Mean = 3.299120, SD = 0.908561), while only 16 (0.98%) reported using other search engines, such as

Baidu and Naver, with a Mean of 3.562500 and SD of 1.273222.

A discipline-wise analysis further indicates that 214 (85.26%) members of faculty from Civil Engineering, 331 (97.93%) from Mechanical Engineering, 456 (98.28%) from Electronics and Communication Engineering, 491 (90.59%) from Computer Science Engineering, and 39 (88.64%) from Biotechnology Engineering prefer Google as their primary search engine for accessing web resources. These findings demonstrate the overwhelming preference for Google across all engineering disciplines. The Chi-square (χ^2) test, with 20 degrees of freedom and the 5% significance level, indicates a statistically significant association

between the preferred search engine and the disciplines ($\chi^2 = 297.505$, $p < 0.001$).

6. Findings

A substantial majority of faculty members reported that library orientation and user education programmes were conducted in their institutions. The highest proportion was observed in Civil Engineering (96.81%), followed by Electronics and Communication Engineering (95.91%) and Mechanical Engineering (94.97%). Comparatively lower proportions were reported in Computer Science Engineering (88.75%) and Biotechnology Engineering (88.64%).

A high proportion of faculty members reported possessing the required information literacy skills and competencies to meet their information needs. The highest proportion was recorded in Computer Science Engineering (95.57%), followed by Electronics and Communication Engineering (91.38%). Although comparatively lower, substantial proportions were also observed in Biotechnology Engineering, Civil Engineering, and Mechanical Engineering.

Among electronic information resources, e-journals were the most widely used, with the highest utilization reported by Computer Science Engineering (95.57%) and Electronics and Communication Engineering (93.10%) faculty members. E-books were also extensively used, particularly in Computer Science Engineering, whereas Civil Engineering recorded comparatively lower utilization. E-reference sources were more frequently used by Computer Science Engineering and Electronics and Communication Engineering faculty members than by those in Mechanical Engineering.

Regarding Boolean operators, 'OR' was the most frequently used (46.00%), followed by 'AND' (37.40%). A notable proportion (12.63%) were unaware of the appropriate Boolean operator for retrieving more documents, while only 3.97 per cent preferred the 'NOT' operator.

Awareness of copyright, plagiarism, and fair use was remarkably high among the respondents. 95.61 per cent were aware of the Copyright Act, 77.36 per cent recognized that web-based information is subject to legal obligations, and 96.52 per cent reported having knowledge of fair use and plagiarism.

The majority of respondents (1,316; 80.29%) reported

that they did not require additional training in information literacy to identify and retrieve information. However, 323 faculty members (19.71%) indicated a need for information literacy training, highlighting the importance of organizing periodic training programmes to enhance information searching, retrieval, and evaluation skills among faculty members.

Google emerged as the most preferred search engine, used by 1,531 faculty members (93.41%). This was followed by Bing (721; 43.99%), Yahoo (608; 37.10%), Dogpile (476; 29.04%), and Yippy Search (341; 20.81%). The findings indicate that Google remains the dominant search engine for information retrieval among faculty members.

6. Suggestions

Based on the above results, the following suggestions are made for further improvement in Information Literacy skills and Competencies of among Faculty Members of Engineering Colleges.

1. The members of faculty should be trained in using various ICT-enabled tools and software related to it.
2. The web search engines retrieve information based on the metadata. It is strongly suggested that the search engine provide content-based information search capabilities for effective information retrieval.
3. The libraries should organise training, seminars and workshops for the users at regular intervals of time to keep users in tune with the latest ICT-enabled technologies.
4. The members of the faculty should further improve their information searching skills to make better use of the largely available web information resources.
5. The speed of the internet should be increased to save users valuable time and to speed up the information search and retrieval process.

6. Conclusion

The study concludes that faculty members of engineering colleges in Bengaluru City possess a generally high level of self-reported information literacy skills and competencies. Books and e-journals were the most widely used print and electronic resources, while Advanced Search and the OR operator were the most preferred search options.

Awareness of the Copyright Act was also high. Significant differences were observed across engineering disciplines in information-source identification, library orientation, search practices, access to print resources, training needs, and preferred search engines. Variations were also found in self-rated computer proficiency, particularly in spreadsheet, programming, and web-design applications. The findings highlight the need for targeted and periodic information literacy programmes that focus on advanced search, retrieval, and evaluation skills, effective use of electronic resources, and areas of lower computer proficiency.

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