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Assessing Information Use and Literacy Competency: a Study Among Engineering Faculty Members in Karnataka State

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Due to information explosion, the academic community faces abundant information choices. As more information is generated, the stakeholders need to know how to identify, acquire, evaluate and use the information. In this connection, the study is being conducted. A survey method was conducted among faculty members working in engineering colleges of Dakshina Kannada, Karnataka State, India. The study results revealed that majority of the faculty members were aware of all the electronic resources except the one net analytics. The faculty members were familiar with author, title, keyword and subject searchers, while, they were not familiar with other search options such as Boolean logic, truncation and phrase search. Lack of resources, lack of high-end computers, and insufficient time slot for accessing the resources were the major challenges faced by them. The study highlighted some of the suggestions based on findings and frame user education module.

Keywords*: Information literacy; Information use; Information literacy competency; Assessment of information literacy; Faculty members; Digital Information Literacy;*

1 INTRODUCTION

Rapid growth of information is witnessed due to advancements in web technology (Tlakula and Fombad, 2017). As web has become the medium for storage and retrieval of information, it enables the users to apply easy and

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quick search options to get the required resources with less time from different locations (Anbu, K *et al,* 2013; Kadir *et al.*, 2016). Knowing the importance of electronic resources, the academic community in higher education institutions are widely accessing (Katabalwa, 2016) and academic libraries also investing a significant portion of budget towards subscription of electronic resources (Isibika, 2018). The amount invested for electronic resources can be compensated, if the resources are utilized effectively. The resources of different types delivered through electronic form are in different format needs checking mechanism for its authenticity and accuracy (Ameen and Naeem, 2021). For effective utilization of the resources, the users need to learn variety of information literacy skills than print resources. These skills enable the users to identify, acquire, evaluate and use the information (Russel, 2008). Unfortunately, little training or lack of computer skills were the major reasons for underutilization of electronic resources (Bana *et al*,2019). Girakaduwa (2019) pointed out that majority of the users could not access the resources as they do not have sufficient knowledge and skills to access the same. From the authors' point of view, digital literacy skills needed for life-long learning and access for pertinent information. And also, the authors found from the literature that no such study has been conducted with regard to information literacy competency among the engineering faculty members in Dakshina Kannada of Karnataka State was the reason motivated us to conduct the study.

2 LITERATURE REVIEW

Review of related literature enables the authors to find out what is being already done and what is to be done at present for the proposed study. It enables to identify the research gap and helps the researcher to take further decision in that direction. Hemavathi and Ramesha (2016) explored information literacy skills of faculty members at Tumkur University, Karnataka. The findings revealed that majority 26 (65%) followed by 21 (52.5%) preferred phrase search and advanced search. In a study conducted by Rajesh Singh and Shailendra Kumar (2020), female social science researchers had higher level of information literacy competency when compared to male researchers. The study conducted by Shwetha Kumari and Mallaiah (2017) investigated faculty members digital information in Mangalore, Karnataka revealed that they were aware of IEEE, Springer and Elsevier science direct e-journals and used the resources for preparing course materials and for teaching. Subject, title, keyword and authors were the preferred options used by faculty members in Bagalkote Horticulture College, Karnataka and publisher and ISBN was used less by them according to Hemavathi and Chandrashekara (2019). Neena Singh (2010) found that IL course is compulsory in many universities and optional in few universities and

the author suggested for uniformity in designing and teaching IL course. Mansour (2017), in his study found significant difference between the respondents' demographic characteristics and digital information literacy, but gender did not have any effect on DIL.

3 OBJECTIVES OF THE STUDY

The major objectives of the study are

(i) To find out the respondents knowledge on available sources

(ii) To explore the search strategy followed and knowledge on information literacy skills

(iii) To identify the challenges faced by the respondents while accessing the resources

4 METHODOLOGY OF THE STUDY

The study is descriptive in nature used questionnaire as data collection tool. There are eighteen engineering colleges in Dakshina Kannada of Karnataka State. The authors have distributed 50 questionnaires to each college faculty members using stratified random sampling method. Out of eighteen colleges, two colleges namely National Institute of Technology, Suratkal and Karavali College of Engineering have not responded and one college namely Marine College of Engineering had less than 30 faculty members. By eliminating the above three colleges, a total of 450 responses from faculty members of 15 engineering colleges were used for analysis. Simple percentage, t-test and one-way ANOVA have been used for analyzing the data.

5 ANALYSIS OF THE STUDY

Out of 450 total respondents, 296 (65.78%) indicated as male, while 154 (34.22%) indicated as female. Among the age-wise distribution, highest 220 (48.89%) fell in 25-35 years age group followed by second highest 186 (41.33%) found between 36-45 years age group and less than 10 percent fell in above 45 years age group. Assistant Professors 321 (71.33%) were the dominant among the designation category and majority 247 (54.89%) have 1-10 years teaching experience followed by one-third have 11-20 years teaching experience and little more than 10 percent have more than 20 years teaching experience (Table I).

Table I: Socio-Demographic Information

Socio-Demographic Information	Faculty Members	Total
Gender	Male	296(65.78%)
	Female	154(34.22%)
Age	25-35	220(48.89%)
	36-45	186(41.33%)
	Above 45	44(9.78%)
Designation	Assistant Professor	321(71.33%)
	Associate Professor	93(20.67%)
	Professor	36(8.00%)
Teaching Experience	1-10 years	247(54.89%)
	11-20 Years	148(32.89%)
	Above 20 Years	55(12.22%)

The results in Table II reveal that Springer Nature was the database aware by high majority 280 (91.87%) followed by 246 (71.93%) and 241 (70.47%) faculty members aware of IEEE/IEE Electronic Library and McGraw Hill Education. It was also found that majority were aware of electronic databases such as Scopus (69.78%), Knimbus digital library (69.30%), Taylor & Francis (68.71%), Web of Science (65.11%), Pro Quest (63.45%) and Institute of Civil Engineer (55.26%). Net Analytics was moderately aware by the faculty members.

Table II: Knowledge on available electronic databases

S.N.	Online Databases	No
1.	Scopus	314(69.78%)
2.	Web of Science	293(65.11%)
3.	Springer Nature	280(81.87%)
4.	Taylor & Francis	235(68.71%)
5.	Institute of Civil Engineer	189(55.26%)
6.	IEEE/IEE Electronic Library	246(71.93%)
7.	Pro Quest	217(63.45%)
8	Knimbus digital library	237(69.30%)
9.	Net Analytics	162(47.37%)
10.	McGraw Hill Education	241(70.47%)

Out of 450 faculty members, 339 (75.33%) were using advanced search strategy and remaining respondents 111 (24.67%) used simple search. Again,

among 339 faculty members who used advanced search (Table III), highest i.e. 188(55.46%), 168 (49.56%) ,156 (46.12%) and 143 (42.18%) have most frequently used title, subject, keywords and author search followed by second highest used frequently and third as less frequently. Whereas for accessing trough 'Publisher', highest have stated as frequently followed by second highest less frequently. For other search options such as website address, DOI, Boolean Logic Operators, Truncation/ Wild Card Search, and Phrase Search, highest have stated as less frequently used followed by second highest stated as frequently.

Table III: Search Strategy Followed

S.N.	Search strategy	Most Frequently	Frequently	Less Frequently
1.	Author	143(42.18%)	136(40.12%)	60(17.70%)
2.	Title	188(55.46%)	99(29.20%)	52(15.34%)
3.	Subject	168(49.56%)	109(32.15%)	62(18.29%)
4.	Keywords	156(46.12%)	105(30.97%)	78(23.21%)
5.	Publisher	67(19.76%)	145(42.77%)	127(37.46%)
6.	Website address	72(21.24%)	120(35.40%)	147(43.36%)
7.	DOI (Digital Object Identifier)	81(23.89%)	118(34.81%)	140(41.30%)
8.	Boolean Logic Operators	75(22.12%)	102(30.09%)	162(47.79%)
9.	Truncation/ wildcard search	63(18.58%)	102(30.09%)	174(51.33%)
10.	Phrases search ("Use of multimedia")	72(21.24%)	96(28.32%)	171(50.44%)

The options through which the faculty members learned information literacy were presented in the Table IV. Majority of the respondents 302(67.11%) aware of electronic resources through user awareness programme followed by 300 (66.67%), and 293 (65.11%) learned through search engines, and Seminars/ Conferences/Workshops. 276(61.33%) each aware through library staff, trial and error method respectively. Again, majority 257 (57.11%), 250(55.56%) and 245 (54.44%) were aware through user manual/modules, fellow teachers and friends. News papers / Magazines and computer professionals were the least sources expressed by the respondents.

Table IV: Sources through which aware of information literacy skills

Source are Aware of Electronic Resources	Total	Respondents
Friends	245	54.44%
Fellow Teachers	250	55.56%
Computer Professionals	171	38.00%
Library Staff	276	61.33%
Newspapers/magazines	197	43.78%
User Awareness Programme	302	67.11%
Seminars/Conferences/Workshops	293	65.11%
Search Engines	300	66.67%
User manuals/Modules	257	57.11%
Trial and Error Method	276	61.33%

Identifying the issues which prevents the access and eliminating the same will increase the access smoothly. Responses have been gathered from the faculty members and provided in the Table V. Lack of needed resources 285 (63.33%) were the major issue faced by the faculty members followed by 249 (55.33%), 243 (54.00%) and 242 (53.78%) faced problems such as non availability of high end computers, lack of authenticity/ reliability of resources and insufficient time slot. Around 229 (51%) reported frequent power failure as the problem faced. The other problems such as retrieving irrelevant information, poor Internet connectivity, lack of basic operating skills, and lack of search skills, changes in URL and information overload were also faced by the respondents. Lack of support from librarians found least among the issues.

Table V: Problems faced while accessing the e-resource

Problems faced	Total	Percentage
(a) Lack of basic operating skills	213	47.33%
(b) Lack of skills on search strategy	205	45.56%
(c) Poor Internet connectivity (Low Speed)	212	47.11%
(d) Frequent power failure	228	50.67%
(e) Non availability of high end computers (Slow processing speed)	249	55.33%
(f) Insufficient time slot	242	53.78%
(g) Getting irrelevant information	219	48.67%
(h) Server Down	195	43.33%
(i) Changes in URL	206	45.78%
(j) Lack of authenticity/ reliability	243	54.00%
(k) Information overload	196	43.56%
(l) Lack of support from library staff	168	37.33%
(m) Lack of needed resources	285	63.33%

T-Test results for faculty members' gender and knowledge on Information Literacy

To know whether significant difference exists between the faculty members' gender and knowledge on information literacy, data were collected from the faculty members' and analysed using t-test and the results are presented in the Table VI. A null hypothesis established in this connection is given below.

Null Hypothesis (H0): There is no significant difference between the respondents' gender and knowledge on information literacy

From the calculated 'P' values, there is no significant difference found between the faculty members' gender and knowledge on information literacy statements such as such as 'can judge the appropriateness and timeliness of information, can judge the usefulness of the information and can easily identify the sources which are needed' as the calculated 'P' values were more than the accepted significant level of 0.05. Whereas, no significant difference was found

between the faculty members gender and knowledge on information literacy statements such as 'have the knowledge of evaluating the information credibility and relevance and able to judge the authenticity and accuracy as the table value', From the mean scores, male faculty members have more information literacy skills on statements such as knowledge on evaluating the information credibility, able to judge the authenticity and accuracy, judge the usefulness of information and easily identify the resources needed. Conversely, female faculty members' knowledge on judging the appropriateness and timeliness of the information is more.

Table VI: T-test results for faculty members' gender and knowledge on Information Literacy

Satisfaction with sources	Gender	No. of Cases	Mean	Variance	Df	t stat	P(T<=t) one tail	t Critical one tail	P(T<=t) two tail	t Critical two tail
Have the knowledge of evaluating the information credibility and relevance	Male Female	296 154	3.385135 3.116883	1.064727 1.345726	448	2.506018	0.006282	1.648262	0.012563	1.965273
Able to judge the authenticity an d accuracy	Male Female	296 154	2.959459 2.74026	0.913605 1.069349	448	2.243742	0.012668	1.648262	0.025337	1.965273
Can judge the appropriateness and timeliness of information	Male Female	296 154	2.905405 2.967532	1.130005 1.129658	448	-0.58825	0.27833	1.648262	0.55666	1.965273
Can judge the usefulness of the information	Male Female	296 154	2.756757 2.714286	1.289785 1.225023	448	0.379656	0.35219	1.648262	0.704381	1.965273
Can easily identify the sources which are needed	Male Female	296 154	2.625 2.61039	1.313136 1.337408	448	0.127921	0.449135	1.648262	0.898269	

One-way ANOVA for faculty members teaching experience and knowledge on Information Literacy

We have also used one-way ANOVA to find out whether significant difference exists between the faculty members teaching experience and knowledge on information literacy. Data for the faculty members' teaching experience and knowledge on information literacy were analysed and presented in the Table VII. A null hypothesis framed in this regard is given below.

Null Hypothesis (H0): There is no significant difference between the faculty members teaching experience and knowledge on information literacy skills

There is no significant difference found between the faculty members' teaching experience and knowledge on information literacy statements as the calculated 'P' values for all the statements were more than the accepted significant level of 0.05.

Table VII: One-way ANOVA results for faculty members teaching experience and knowledge on Information Literacy

Statements	Source of Variation	SS	DF	MS	F	P-Value	F Crit
Have the knowledge of evaluating the information credibility and relevance	Between Groups	4.393291	2	2.196645	1.877846	0.154124	3.015899
	Within Groups	522.8867	447	1.169769			
	Total	527.28	449				
Able to judge the authenticity and accuracy	Between Groups	4.555458	2	2.277729	2.34901	0.096641	3.015899
	Within Groups	433.4357	447	0.969655			
	Total	437.9911	449				
Can judge the appropriateness and timeliness of information	Between Groups	3.438481	2	1.71924	1.527404	0.218229	3.015899
	Within Groups	503.1415	447	1.125596			
	Total	506.58	449				
Can judge the usefulness of the information	Between Groups	1.645684	2	0.822842	0.649323	0.522891	3.015899
	Within Groups	566.4521	447	1.267231			
	Total	568.0978	449				
Can easily identify the sources which are needed	Between Groups	1.508737	2	0.754368	0.571035	0.565352	3.015899
	Within Groups	590.5113	447	1.321054			
	Total	592.02	449				

6 DISCUSSIONS

The results showed that the faculty members have sound knowledge about all the electronic databases except 'net analytics'. A study conducted by Shwetha Kumari and Mallaiah (2017) revealed that the respondents aware of IEEE, Springer and Elsevier science direct e-journals supports our study results. Whereas, in another study conducted by Vijayalakshmi et al (2017), only 9% and 8% of users were using Scopus and ProQuest databases is deviating from our study. Author, title, subject and keywords are the most preferred search options found in this study is in-line with study conducted by Hemavathi and Chandrashekara (2019). In this study, the faculty members were not familiar with some advanced search strategies such as Boolean logic operators, DOI, Phrase search and Truncation and they have faced many challenges. Phrase search used moderately in our study is coinciding with the finding of Hemavathi and Ramesha (2016); Senthur Selvi and Ganesan (2021). Finding of Rajesh Singh and Shailendra Kumar (2020) proved that female researchers had higher level of information literacy competency which is deviating from our study results which depicted that male respondents have more knowledge on information literacy skills. Among the challenges, faculty members of our study faced lack of basic operating skills, lack of internet connectivity and lack of computer facilities support the findings of Mansour (2017). Majority of the faculty members from our study aware of information literacy skills through friends and fellow teachers corroborates with results of Rajunaik and Naik

(2017). Neena Singh (2010) has pointed out that user education and literacy courses are very important in today's context and suggested to include an exclusive credit course integrated into regular course curriculum on use of library resources and retrieval techniques. Hartmann (2001) suggest that library should play lead role in developing information literacy skills. Difference exists between the respondents' demographic characteristics and knowledge on information literacy. Based on the findings, the study suggested

- The library to frame user education module in consultation with faculty members to provide training periodically
- Organise information literacy week or day programme to educate the importance of information literacy skills particularly search methods as the faculty members were poor in advanced searches.
- Adequate computers with high internet connectivity and support from library staff will increase their utilisation of resources.

7 CONCLUSION

In this study, the authors found that the respondents were using some basic level searches which may be due to lack of information literacy skills. Adequate knowledge on information literacy skills enables the academic community to use the resources effectively. In response to the fast changing digital environment, the library need to educate the users to acquire necessary skills to identify, locate and retrieve the documents. The study can be further extended to the faculty members working in engineering colleges of Karnataka state.

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