



Use and Search Pattern of Electronic Resources in Five Autonomous Engineering Colleges (Bengaluru)

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Abstract

Purpose: This study evaluates the use of electronic resources among the faculty in five autonomous Engineering Colleges in Bengaluru. It evaluates the purpose, benefits, preference of web browsers, search engines, file formats, problem faced, and search patterns as the key parameters. It highlights some problems, constraints and forward suggestions for better use of electronic resources.

Methodology/Approach: The structured questionnaire is used for data collection besides personal interview and observation to add clarity.

Findings: The study assesses the faculty awareness and use of electronic resources in their academic and research needs. Besides, familiarity about search patterns for effective retrieval.

Research Limitations: The study is limited to the faculty of the Autonomous Engineering Colleges affiliated to Visvesvaraya Technological University (VTU) in Bengaluru Region of Karnataka State, India.

Keywords: e-resources; search pattern; e-resource use; Autonomous Engineering Colleges.

Paper Type: Survey cum Research

Introduction

The society is moving in different directions and fascinated by developments through accessing information from varied sources. It has consequently imposed greater demand on libraries in their transformation and to sustain onslaughts and impact of information and communication technology, the electronic information resources particularly e-journals, e-books, e-databases, e-reports, e-patents etc serve as the life blood for the academic, research and extension activities for any type of institution and organization (**Okello-Obura & Magara, 2008**). These offer many resources and services across the globe either fee based or free based. The fee based resources may not be offered at ease by developing and under developing countries more particularly in Science and Technology related resources as the subscription cost of Science and Technology journals are increasing steadily which doesn't match with the allocated grant. Therefore, many libraries seek alternatives to overcome this problem and thanks to Open

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Access Initiatives now a plenty of resources are available on the Web (**Luambano & Nawe, 2004**). It is in this context that the researchers endeavour to examine the use of the electronic information resources by the academicians in their intellectual pursuits in the five autonomous engineering colleges affiliated to Visvesvaraya Technological University (VTU), Bengaluru (Karnataka, India).

Review of Literature

Numerous studies were carried out to assess the use of electronic resources and search pattern by faculty members of institutions of higher learning across countries. The following para places here a brief account of some studies carried out during last few years. **Tomney and Burton (1998)** has conducted a survey of British Universities academic staff in late 1996 and early 1997 and found that 28% of them use e-journals. The study further reveals that the well-established journal titles have started producing electronic versions to accelerate their popularity. **Renwick (2005)** deliberates on the need for promotion of e-resources for their better use. He recommends putting greater emphasis on the promotion of library's e-resources. **Naushad (2005)** has surveyed use of electronic information services (EIS) among the users of the Indian Institute of Technology (IIT) Library in Delhi sensing awareness of EIS Services, use of e-journals, advanced search facilities, acquaintance with and purpose of electronic information sources besides problems faced while using EIS, infrastructure facility available and satisfaction level . **Ekwelem, Okafor and Ukwoma (2007)** have made an extensive survey of EIS as information sources available and accessible electronically through such computer networked facilities as online library catalogues, the internet, the World Wide Web and digital libraries. **Sharma (2009)** examines the existence of various e-resource databases in Guru Gobind Singh Indraprasth University Library. He has highlighted the preferences and importance of online resources among the teachers and research scholars. **Natarajan, Suresh, Sivaraman, and Sevukan (2010)** have carried out a survey of faculty and research scholars about use and perception of e-resources in Annamalai University, Chidambaram, India. Despite availability of wide range of e-resources, the frequency of their use is rated low. The reasons identified are paucity of time, lack of awareness, understanding of subject coverage and slow downloading. **Thanuskodi (2011)** examines the usage of electronic resources at Dr T.P.M. Library, Madurai Kamaraj University and reveals that M.Phil students undertake more searching of e-resources followed by postgraduate students and PhD Scholars the least. It also indicates that users are aware of the e-resources and their various types but recommends the improvement in the access facilities

with high internet speed and increasing subscription base of the electronic information resources.

Objectives

The objectives of the study are:

- To assess use, awareness and purpose in undergoing use of electronic resources.
- To spot web browsers and search engines and outline different search methods and patterns for retrieving resources.
- To highlight file formats and storage medium for downloading and storage.

Scope

This study is limited to achieve the laid down objectives among the faculty of five Autonomous Engineering College affiliated to Visvesvaraya Technological University (VTU) in Bangalore Region of Karnataka State. The institutions include R. V. College of Engineering, M. S. Ramaiah Institute of Technology, P. E. S. Institute of Technology, Nitte Meenakshi Institute of Technology and B. M. S. College of Engineering.

Data Collection

Scientific investigation involves careful and proper adoption of research design, use of standardized tools and texts in identifying adequate sample techniques for analyzing the data. However, in this survey a questionnaire was properly drafted, tested and employed to realize the objectives and collect the primary data. The questionnaire was distributed among 833 faculty members of the five institutions, out of which 598 participants filled it making response rate 71.78%. Among 598 respondents 11 faculties were found not using electronic information resources. Thus, response rate is reduced to 587 (70.46%). In addition to the said tool, personal interview and observation methods were also used to collect the required information.

Results and Discussion

The Profile

The demographic characteristics of the universe relate to designation, gender and age group summarized below depict that the total 598 members are differently designated in the categories of 'Assistant Professors' (65.05%); 'Associate Professors' (21.73%) and Professors (13.21%). The majority members (68.39%) are of male gender compared to female folk (31.60%). However, the age wise break up depict that only 03.17% of faculty belong to age group of 'below 25 years', followed by 28.76% members in the age group of '26-30' while 21.23% fall in the

range of '31-35 years'; while only 01.00% faculty fit in to the range of 'above 55 years' of age group. Thus, majority of the respondents are male designated as Associate professors between 25-35 age groups (Table1).

Table 1: Population Profile

Designation	Users
Assistant Professor	389(65.05)
Associate Professor	130(21.73)
Professor	79(13.21)
Gender	
Male	409(68.39)
Female	189(31.60)
Age	
Below 25	19(03.17)
26-30	172(28.76)
31-35	127(21.23)
36-40	103(17.22)
41-45	82(13.71)
46-50	53(08.86)
51-55	36(06.02)
55 Above	06(01.00)
Total	598(100)

Figures in parenthesis indicate percentage

Internet and Types of Resources

All the participants make use of internet for accessing and searching electronic information resources and experiment reveals that 33.27% of the faculty have 4-8 years of experience in using internet, followed by 27.59% with more than 12 years of experience, while 25.41% have about 8-12 years of experience and only 02.84% reveal having less than one year experience. Thus, it is evident that most of the faculty members have started the use of internet and its resources during a time frame of one to five year (Table 2). The different types of electronic resources used are e-teaching materials (97.99%); e-journals (96.32%) ,e-books (83.61%); open source literature (81.43%); students and faculty generated resources like projects, assignments(66.38%) etc., e-reference resources like encyclopedias, dictionaries etc (66.22%). Besides, faculty use e-tutorials (59.03%); Blogs, wikis; RSS feeds (50.16%); e-database (49.66%); Electronic Thesis and Dissertations (44.48%); e-conference proceedings (43.47%); e- technical reports (33.27%); subject gateways/e-portals (32.60%); e-standards /specifications (31.93%); e-drawings and designs (27.42%) and e-patents (22.07%) (Table 3).It shows that most of the resources are used but in a varied number.

Table 2: Use of Internet

Period	User
Less than 1 year	17 (02.84)
Between 1-4 years	65(10.86)
Between 4-8 years	199(33.27)
Between 8-12 years	152(25.41)
More than 12 years	165(27.59)
Total	598(100)

Figures in parentheses indicate percentage

Table 3: Use of Electronic Resources

Electronic Resource	User	Electronic Resource	User
E-Journals	576(96.32)	E- Databases	297(49.66)
E-Books	500(83.61)	E- Thesis & Dissertations	266(44.48)
E-Technical Reports	199(33.27)	E- Patents	132(22.07)
E-Conference Proceedings	260(43.47)	Subject Gateways/ E-portals	195(32.60)
E-Drawings and Designs	164(27.42)	Blogs, Wikis, RSS feeds	300(50.16)
E-Teaching Materials	586(97.99)	Open Source Literature	487(81.43)
E-Standards/Specifications	191(31.93)	E- Reference resources	396(66.22)
E-Tutorials	353(59.03)	Students and faculty generated resources	397(66.38)

Figures in parentheses indicate percentage

Awareness Level and Purpose

The awareness level of electronic information reveals that faculty (54.51%) is largely aware about new resources through personal communication with friends, subject experts and resource persons, and through serendipity, browsing or looking for materials by about an equal member (51.83%) and also looking into citation in report/ journals/conference papers (48.99%) whereas user (45.31%) also refer to resources by the librarian. The others (44.31%) look into bibliographical databases and announcements in Journals (38.12%); e-mail alerts form publishers/distributors (36.78%) (Table4). The survey depicts that faculty(74.74%) use resources mainly for the purpose of reading/ writing research proposal, reports and projects, followed by those who use for: i) preparing / accessing teaching materials (73.07%); ii)reading/ writing research articles(71.73%);iii) preparation for Seminars (68.39%); conference and workshop (59.36%) and for collecting general information (35.11%); for basic scientific and technical information(29.76%); curriculum design (22.90%) to access audio/ visual materials and to access drawings, designs, graphs, patents etc (15.88%) (Table5).

Table 4: Awareness about electronic resources

Awareness Factor	User
Bibliographical Database Searching	265(44.31)
Announcements in Journals	228(38.12)
Cited in report/ journals/conference papers	293(48.99)
Referred by the librarian	271(45.31)
serendipity, by browsing or looking for materials	310(51.83)
E-mail alerts form publishers/distributors etc.	220(36.78)
personal communication with friends, subject experts and resource persons	326(54.51)

Figures in parentheses indicate percentage

Table 5: Purpose using electronic resources

Purpose	Faculty
Reading/ Writing research articles	429(71.73)
Reading/ Writing research proposal, reports and projects	447(74.74)
Preparing/ accessing teaching materials	437(73.07)
For drawings, designs, graphs and patents	95(15.88)
Curriculum design	178(29.76)
Preparation for Seminars, conference and workshop	409(68.39)
For basic scientific and technical information	210(35.11)
For collecting general information	355(59.36)
To access audio/ visual materials	137(22.90)

Figures in parentheses indicate percentage

Search Engines and Tools

Different search engines for searching the resources illustrate that users mainly prefer Google (94.81%), yahoo (70.73%), Bing (47.65%) and MSN (25.25%). The other engines used are in varying degrees including InfoSeek, HotBot, Galaxy, Excite, SCIRUS, Lycos and Inktomi, Magellan, Northern Light, WebCrawler (Table 6). The search options employed indicate that faculty make use of The Basic/ simple search (30.43%) , followed by advance search (19.06%) while 50.50% faculty prefer and use both basic and advance search options.(Table 7)

Table 6: Search Engine choice

Search engine	Faculty preference*	Search engine	Faculty preference*
Alta Vista	143(23.91)	Magellan	38(06.35)
Bing	285(47.65)	Lycos	45(07.52)
Yahoo	423(70.73)	MSN	151(25.25)
Galaxy	81(13.54)	Northern Light	21(03.51)
Google	567(94.81)	Open Text	47(07.85)
HotBot	88(14.71)	SCIRUS	53(08.86)
InfoSeek	131(21.90)	WebCrawler	20(03.34)
Excite	72(12.04)	Inktomi	45(07.52)
Meta Eureka	11(01.83)	Others	00(00.00)

Figures in parentheses indicate percentage

Table 7: Search Strategy option

Option	Faculty option*
Basic / Simple Search	182(30.43)
Advance Search	114(19.06)
Both	302(50.50)
Total	598(100)

Figures in parentheses indicate percentage

Bibliographic Search

The fields relating to Bibliographical description are spread over many fields for search and access. The author field is used less frequently (37.79%) but title field is used most frequently (53.34%) against author field (35.95%). The subject field search is again used most frequently (40.80%) and less frequently by 10.53% users. The keyword is popular among 48.66% consumers but 12.87% use it less frequently. The publisher based search is made by (30.26%) faculty less frequently, followed by 28.59% frequently while 10.20% do not employ it. The author address is used uncertainly by 31.43% and less frequently by 25.41% clients. Most patrons (37.12%) do not use abstract field while 28.26% show uncertainty and 14.54% indicate using it frequently (Table 8). This shows that the ICT revolution has not impacted the search strategy to a large extent in the context of bibliographical description of resources.

Table 8: Bibliographic Search

Bibliographic Fields	Most Frequently	Frequently	Less Frequently	Uncertain	Does Not use
Author	215 (35.95)	226 (37.79)	108 (18.06)	36 (06.02)	13 (02.17)
Title	319 (53.34)	185 (30.93)	71 (11.87)	22 (03.67)	01 (00.16)
Subject	244 (40.80)	237 (39.63)	63 (10.53)	43 (07.19)	11 (01.83)
Keywords	291 (48.66)	197 (32.94)	77 (12.87)	24 (04.01)	09 (01.50)
Publisher	67 (11.20)	171 (28.59)	181 (30.26)	118 (19.73)	61 (10.20)
Author address	36 (06.02)	124 (20.73)	152 (25.41)	188 (31.43)	98 (16.38)
Abstract	52 (08.69)	87 (14.54)	68 (11.37)	169 (28.26)	222 (37.12)

Figures in parentheses indicate percentage

Advance Search Tools

The survey about advance search facilities reveal that 'Phrases search' option is employed by 51.50% faculty most frequently while the Boolean search choice is used by 32.10% frequently followed by 27.75% members less frequently. The field bases search opportunity is used by clients (41.13%) frequently when 04.18% do not use it. The DOI based search alternative is used frequently (32.10%) while 18.39% do not use such substitute. The very rarely used search alternative is Truncation/ Wildcard mode i.e. 25.41% use it uncertainly followed by 19.23% frequently and 32.10% do not use it (Table 9).

Table 9: Advance Search use

Advance Search techniques	Most Frequently*	Frequently	Less Frequently*	Uncertain	Does not Use
Boolean search	89 (14.88)	192 (32.10)	166 (27.75)	79 (13.21)	72 (12.04)
Truncation/ wildcard search	26 (04.34)	115 (19.23)	113 (18.89)	152 (25.41)	192 (32.10)
Field based search	231 (38.62)	246 (41.13)	83 (13.87)	13 (02.17)	25 (04.18)
Phrases search	308 (51.50)	202 (33.77)	54 (09.03)	17 (02.84)	17 (02.84)
DOI based search	119 (19.89)	192 (32.10)	108 (18.06)	69 (11.53)	110 (18.39)

Figures in parentheses indicate percentage

File Format and Storage Media

The most popular format for downloading electronic resources by the majority is PDF (87.29%). It is followed by MS-Word (76.58%); HTML (64.71%); PPT (57.69%) PPT, RTF (22.74%); Postscript and Latex (08.69%). The ASCII (08.69%); OCR (06.85%) and SGML (02.50%) are used rarely (Table10). The Preferred storage medium for storing electronic resources is still pen drive (92.14%) followed by compact Disk (64.54%); DVD (42.97%); Portable Hard Disk (29.09%) and Memory Card (28.92%). Rarely faculty prefers blue Disk /Ray (01.33%) for the storage (Table11).

Table 10: File format Popularity

File Format	Faculty preference
PDF	522(87.29)
HTML	387(64.71)
MS-Word	458(76.58)
Rich Text Format	136(22.74)
PPT	345(57.69)
SGML	15 (02.50)
job script	52(08.69)
Latex	52(08.69)
ASCII	46(07.69)
OCR	41(06.85)

Figures in parentheses indicate percentage

Table 11: Storage Media precedence

Storage Medium	Faculty preference
Pen Drive	551 (92.14)
Compact Disk	386(64.54)
DVD	257(42.97)
Portable Hard Disk	174(29.09)
Memory Card	173(28.92)
Blue Disk/Ray	08(01.33)

Figures in parentheses indicate percentage

Conclusion

The emergence of internet as a ubiquitous global information and communication resource propelled people's lives into the digital epoch. Due to rapid advancement in information communication technology the internet has become an inseparable part of today's engineering educational system. With the development in the area of internet and information technology, more and more of the educational resources are being produced, distributed and accessed in the digital format. The dependency on internet based services is increasing everyday and users of engineering colleges too are depending much more on information resources available through internet for various educational purposes. It is clear from the study that all the engineering faculty members' access electronic information resources. The main purpose of using internet is for accessing e-teaching materials. The use of e-resources benefits the faculty to access up to date information. Internet explorer and Google are the most preferred web browser and search engine used by the faculty for accessing electronic resources. The faculty prefers both basic and advanced search options. There is a very good spread of use of field based search and advance search options among them. The most preferred field based search option is title search and the most preferred advanced search option 'phrase search option'. For better utilisation of electronic information resources the faculty needs to be made aware in using advanced search options available in search menu of electronic information resources. The web designers/ publishers/ distributors should provide online help menu in the search page for better utilisation of their information resources. The speed of the internet should be increased and the technical institutions should organize seminars, workshops and orientation programmes for faculty and students at regular interval of time to keep them in tune with latest technologies. The institution should set-up Ezproxy server in the library and information centre to provide library resources and services to the door steps of it users. This Ezproxy setup will automatically improve the use of electronic information resources form off campus access mode. The electronic resources in the virtual world represent a large investment of people's effort, money and wisdom. The users should become familiar with latest search techniques for optimum utilization of available electronic information resources.

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