

Information Seeking by Biomedical Faculty Members and Research Students in India: A Comparative Study

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Abstract: *The present paper is centred on information seeking behaviour of biomedical faculty members and research scholars in India. Some common issues only have been dealt. The main objective of this study is to find out relative status of different forms of information viz. texts, audio-visual, animations etc., newness of documents studied and usage frequency of the same, and effect of hyperlinks on the reading by biomedical faculty members and research scholars. A simple random sample survey method has been applied to the study at 95% confidence level using online software SurveyMonkey. Texts are found the most used form despite its format viz. printed or electronic. Use of audio-visual resources is found not being common, however increasing. The respondents were found making use of currently published information sources. Hyperlinks are found supportive to study in depth and in general.*

Key Words: Information Seeking Behaviour, Audio-visual Resources, Electronic Resources, Hyperlinks, Text.

1. Introduction: Information is power and needs to be communicated. The study of information needs and seeking behaviour dates back to 1948 (Bernal, 1960). During last two decades or so, a considerable amount of literature has been produced on it for different subject in different contexts. Development of digital resources and its online availability has catalysed the process of information publishing, access and use. Multimedia presentation of information composed of hypertexts and audio-visual resources presents varied and interconnected information sources communicated individually or in clouds. However prints are favoured in case of reading. It is uncertain that all the new criteria of electronic resources have attracted the users. Demographic characteristics and specialties of the users also affect the way information is accessed and studied. The present paper tries to know some aspects of information seeking by faculty members and research scholars of biomedical sciences in India which is an important field of information dealing with human health, hygiene and life.

1.1. Need of Study: It is essential/ vital for a LISc professional to know the users' information needs and their information seeking behaviour to manage proper information collection, upgrading existing facilities for further improvement of library and information services to proper users at proper time efficiently, expeditiously and exhaustively irrespective of form, format and geographical location. The need arises due to availability of

fewer literatures to guide the library professionals to serve better to biomedical information users in India. The ICT has changed information presentation, propagation, storage, retrieval, search and accessing and therefore attitudes of users and role of information intermediaries has been changed. It has been experienced that Information seeking behaviour of information users has been changed drastically for last two decades due to expansion of digital resources and the Internet. This all sets a new paradigm to information access and publishing. All this necessitates studies for various users groups to serve them better and the present paper also is an attempt to know the characteristics of biomedical faculty members and research scholars to serve them better and making biomedical academic libraries more sound and effective.

1.2. Objectives: The main objectives of the study are stated below:

1. To know the status of different forms of information in age of electronic publishing.
2. To know the effect of hyperlinks on reading.
3. To know the new paradigms of information publishing and its impact on information access by the respondents.

1.3. Assumptions: The questionnaires were sent electronically online assuming that all the biomedical faculty members and research scholars are information literate and exposed to Internet services.

1.4. Scope and Limitations: The present study has been carried out at national level in India and online questionnaires were sent to the respondents among more than one hundred institutes in India through emails. The study covers all the geographical locations in India. The study is limited to information literate professionals only.

2. Literature Search: Online availability of information at a single screen has changed the habits of information search, access, reading and writing in a tremendous way and the people carrying books with them are converted into people carrying their laptops and android mobiles. It seems that invention has created the needs at the place of needs creating inventions. The big difference between electronic and print resources is the property of multimedia and hyperlinks possible in electronic formats only. **Reinking** (1998) opined that hypertext illustrates the potential uniqueness of electronic texts and literacy is transformed to use the same. **Bolter** (1998) remarked the same that instability and multiplicity of a hypertext defines a new relationship among author, text and reader – a

relationship different from the one that exist with printed technology. **Gilster** (1997) pointed out that hypertext are not suited to all kinds of reading. In narrative, the flow or sequence is important. For research, on the other hand, hypertext is very useful. **Fitzsimmons, Weal and Drieghe** (2013) determine that hyperlinks highlight the important information to the users. **Lakshmi Sankari, Chinnasamy and Venkatachalam** (2011) observed that only 9.48% of users prefer audio-visual resources in an engineering college in Salem. **Bo-Christer Bjork, Ziga Turk** (2000) found that 75% of students and professors desire that the papers should be quickly available on the Internet without bothering delays of formal publishing procedures. 67% of them believe that the Web is more likely to generate personal contacts and it helps to in reaching to more peoples (by 59% respondents). **Jamali and Nicholas** (2010) found that 32.7% of faculty members and research scholars in astronomy and physics in University College, London read articles published within one week. 20.4% of 98 respondents read articles published within one month. 10.2% read within one year, 12.2% read within 4-5 years, 4.1% more than 15 years old documents.

This all leads to assume that preference of electronic resources are not possible for all the purpose, but online availability of it tends to make a favoured source of information search and publishing. It also appears that audio-visual resources are not much common as the texts.

3. Research Methodology: The questionnaire was sent to 1786 number of respondents in which 297 received were suitable for the study (response rate 16.63%). For determining sample size, Morgan formula was applied for unlimited population.

$$SS = Z^2 \times (p) \times (1-p) / c^2$$

Where,

SS = Sample Size

Z = Z - Value (1.96 for a 95 percent confidence level)

p = Percentage of population picking a choice expressed as decimal

c = Confidence Interval expressed as decimal

Chi-square comparisons are followed to test the significance of differences between designation groups.

4. Data Analysis: Half (49.8%) of respondents were in the age group 26-35 Years and one fourth (24.2%) of them were in age group 36-45 Years. Almost three fourths (71.7%) of

respondents were males and rest were females. The number of research scholars (96) and assistant professors (95) were somewhat more than associate professors (47) and professors (59) [Table 4.0]

Table 4.0: Demographic Structure of the Respondents

Age (in Years)	Number	Gender	Number	Designation Levels	Number
16-25	15 (5.1%)	Female	83 (27.9%)	Professor	59 (19.9%)
26-35	149 (50.2%)	Male	214 (72.1%)	Associate Professor	48 (16.1%)
36-45	71 (23.9%)	Total	297	Assistant Professor	95 (32.0%)
46-55	36 (12.1%)			Research Scholar	95 (32.0%)
56-65	27 (9.1%)			Total	297
Total	313				

4.1. Preferred Forms of Information: In the first question of the questionnaire, respondents were asked to tell their preference of types of information from text, graphs (and tables and diagrams), images, animations and audio-visual resources. Respondents were asked to arrange different forms in respect to their use by them as first, second, third, fourth and fifth. First ranked form was scored one and last ranked were scored five. Averages of scores were calculated. It is clear that less scores means more used forms of information (Table 4.1).

Table 4.1: Preferred Forms of Information

Options	Rank Scores	Rank
Text	1.75	1
Graphs, Tables & Diagrams	2.36	2
Images (Photographs)	2.79	3
Animations	3.84	4
Audio-visual Sources	4.28	5

Texts were found highest preferred form followed by 'graphs, tables and diagrams', images (photographs), animations and audio-visual resources. In study by **Lakshmi Sankari, Chinnasamy and Venkatachalam** (2011), audio-video resources were preferred by 9.48% of users only in an engineering college in Salem. In this survey only 3.5% of respondents

preferred audio-visual resources at first place where 70.2% of them preferred text at the same place. It seems that texts are more informative and easy for biomedical scientists.

4.2. Proportion of Audio-visual Resources among All Used Resources: The next question is focussed on audio-visual resources only and respondents were asked to disclose proportion of audio-visual resources among the all used resources (Table 4.2).

Table 4.2: Proportion of Audio-visual Resources among All Used Resources

Option	Almost Zero	< 5 %	5 – 10 %	> 10 %
Number (%)	25 (10.0%)	86 (34.5%)	78 (31.3%)	60 (24.1%)
Cumulative Number (%)	25 (10.0%)	111 (44.5%)	189 (75.8%)	249 (100.0%)

The results show that 75.8% of respondents were using these resources below than ten percent of total used resources cumulatively. Only 24.1% of respondents were using audio visual resources more than ten percent of total used resources. It was amazing that 10.0% of respondents conferred that they were not using these resources at all. The results are in congruence to the previous question and it is confirmed that use of audio visual resources is not so common despite its increasing use by the respondents.

4.3. Age of Recently used Document: Generally accessing serial publication is done within a limited period of time, generally before publication of next issue of the same. At the other hand textbooks and other non-serials can be consulted after a long time also. Electronic online publications support to make resources available very fast and serial publications are reached to its audience very quickly. Social networking sites and web 2.0 technologies have provided a platform of discussions on such publications which also increase scholarly communications. The third question of the questionnaire was set to know the newness of the documents attended by the respondents i.e. faculty members and research scholars in India (Table 4.3).

Table 4.3: Age of Recently used Document

Option	One Week	One Month	One Year	2-5 Years	5-10 Years	> 10 Years
Number (%)	164 (64.1%)	53 (20.7%)	18 (7.0%)	6 (2.3%)	6 (2.3%)	9 (3.5%)
Cumulative Number (%)	164 (64.1%)	217 (84.8%)	235 (91.8%)	241 (94.1%)	247 (96.4%)	256 (100%)

The result revealed that most of the respondents consult recently published documents, more precisely to say, 64.1% of them use documents within one week of publishing, where 84.8% of them make use of documents within one month (cumulated with one week). The study by **Jamali and Nicholas** (2010) had disclosed that 32.7% and 20.4% of faculty members and research scholars in astronomy and physics in University College, London read articles published within one week and one month respectively which is lower than the results of this survey.

4.4. Average Use Frequency of Documents: Documents consulted frequently, are more expected to be purchased or subscribed by the users themselves. Repeatedly used documents have to be preserved for longer times also. In next question, respondents were asked about frequency of use of documents used by them at average (Table 4.4). The results summarizes that most of the respondents read the documents generally only once (39.9%) or twice (30.6%). Cumulatively a large proportion (70.5%) of total respondents read the documents only once or two times. When, this result is integrated with the results of the previous question, it can be analysed that documents are studied within a short period of time and not repeated frequently.

More precisely it can be concluded from the results of two questions that digital age has minimised the longevity of the documents in biomedical sciences.

Table 4.4: Average Use Frequency of Documents

Option	Only One	Twice	Thrice	4-10	Unlimited	Can't say
Number (%)	99 (39.9%)	76 (30.6%)	11 (4.4%)	10 (4.0%)	8 (3.2%)	44 (17.7%)
Cumulative Number (%)	99 (39.9%)	175 (70.5%)	186 (74.9%)	196 (78.9%)	204 (82.1%)	248 (100%)

4.5. Searching of Documents given as References and Bibliography: References and bibliographies are given for authentication of the document that is a list of documents cited or contacted. Searching for these documents reflects the interests of the readers in the subject. The respondents were asked if they search the documents enlisted in references and bibliographies in a further question of the questionnaire (Table 4.5).

Table 4.5: Searching of Documents given as References and Bibliography

Option	Yes	Sometimes	No	Sum
Number (%)	180 (70.0%)	73 (28.4%)	4 (1.6%)	257

It was found that almost three fourths (70.0%) of respondents search the documents enlisted as references and bibliography regularly, while one fourths (28.4%) of them search it sometimes. Only 1.6% of them do not make search of documents enlisted as the same. Hence it can be predicted that biomedical faculty members and research scholars are curious to search of further works in their fields and desire authenticated works only.

4.6. Opinion if Hyperlinks make Reading Easy: In a question, respondents were asked to indicate about their opinion on hyperlinks if those make reading processes easy (Table 4.6). It is obvious that hyperlinks are possible in case of electronic resources only.

Table 4.6: Opinion if Hyperlinks make Reading Easy

Option	Yes	No	Sum
Number (%)	225 (91.8%)	20 (8.2%)	245

Most (91.8%) of respondents opine that hyperlinks making the process of reading easy. Only 8.2% of them do not believe the same about it. The findings are close to the findings by **Fitzsimmons, G.; Weal, M. and Drieghe, D. (2013)** where he had conferred that hypertexts make reading process more meaningful highlighting the important information

4.7. Opinion if Hyperlinks support Serious Reading: The next question was also set about hyperlinks, but for serious reading. Serious reading may be in-depth or sequential (narrative). **Gilster (1997)** points out that hypertext are supportive in research, but obstructing in narrative where free flow of reading is important. This question hence tries to know compatibility of hyperlinks to serious reading by the respondents and positive results might infer that reading by such respondents are in depth at the place of narrative (sequential) reading (Table 4.7).

Table 4.7: Opinion if Hyperlinks support Serious Reading

Option	Yes	Sometimes	No	Sum
Number (%)	149 (61.3%)	72 (29.6%)	22 (9.1%)	243

It was revealed that only 61.3% replied 'yes' to this question where 9.1% of them (which is approximately equal to 'no' in previous question) replied 'no'. The present question had a third option 'sometimes' (29.6%).

Lesser percentage to the option 'yes' as compared to previous question confirms that hyperlinks are less suitable to serious reading as compared to common reading. It can be concluded from the results of these two questions that such respondents have more narrative texts than in general reading by them.

4.8. Opinion on ICT if it has supported to Information Publishing: In the last question of the questionnaire, respondents were asked about their opinion if they feel that ICT especially Internet has been supportive to publishing of their works. The study shows (Table 4.9) that half of faculty members and research scholars consider the ICT to be supportive in information publishing up to 51-100%. However, more than one fourth (28.5%) of them consider it to be supportive up to 26-50% only.

Table 4.8: Opinion on ICT if it has supported to Information Publishing

Option	No	Yes, up to 25%	Yes, 26-50%	Yes, 51-100%	Can't Say
Number (%)	0	28 (9.9%)	81 (28.5%)	142 (50.0%)	33 (11.6%)
Cumulative Number (%)	0	28 (9.9%)	109 (38.4%)	251 (88.4%)	284 (100%)

The study **Bo-Christer Bjork, Ziga Turk** (2000), also reveals that attraction of students and professors to the Internet as a fast publishing platform. Hence, it is apparent that Internet is a supportive tool for information publishing for larger extent of the professionals.

4.9. Designation based comparisons: The present study was related to teaching faculty members at different designation levels (i.e. assistant professors, associate professors and professors) and research scholars. To find out if there is significant differences in information seeking by individuals at different strata, chi-square analysis was followed. The details are presented in the Table 4.9. It was found that there is no significant differences between the respondents on any aspect of information seeking mentioned in the questionnaire.

Table 4.9: Designation Based Comparisons

Sr.	Question	D. f.	χ^2 Value	Critical Value	Significance of Relationship
1	Use Proportion of Audio-Video Resources among All Used Resources	9	14.228	16.919	No
2	Average Age of Documents Used	15	20.962	24.996	No
3	Average Use Frequency of Documents	15	18.871	24.996	No
4	Searching of Documents given as References and Bibliography	6	5.842	12.592	No
5	Opinion if Hyperlinks make Information Access Easy	3	5.291	7.815	No
6	Opinion if Hyperlinks supports Serious Reading	6	8.691	12.592	No
7	Opinion on ICT if it has supported to Information Publishing	8	8.800	15.507	No

5. Discussions: The results show that texts are still an effective form of information in digital era and expansion of audio-visual resources is limited. Hyperlinks seem supportive in general reading, however somewhat less supportive to the serious readings by them. Majority (70.0%) of users search regularly the documents enlisted as references and bibliographies. New published documents are accessed by the respondents where use frequency of it is few confirming serial publications and online documents more read by the specified information user group. Variations due to difference in designation levels are insignificant in each case. It seems that biomedical faculty members and research scholars are more tended to newly generated information than students in astronomy and physics.

6. Suggestions:

1. Librarians of biomedical academic libraries are suggested to increase subscription of online resources including subscription of e-books to benefit faculty members and research scholars more efficiently as most of them read recently published documents.
2. Hyperlinks are found supportive in common and serious reading confirming online resources including World Wide Web much productive to their studies.

3. Libraries should have audio-visual equipments in good quantity to serve its users satisfactorily as one fourth (24.1%) of given community use it in good quantum (more than ten percent of total information sources).

7. Conclusion: Texts are used for information access primarily by most of the biomedical faculty members and research scholars in India irrespective to print or electronic format. Hyperlinks are supportive in information access and reading. Internet has improved the process of information publications and newly published documents are more used by the faculty members and research scholars of biomedicine. It is expected that use of audio-visual resources will be increased with advancement of time.

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