

**INFORMATION BEHAVIOR OF SCIENTISTS OF THE NATIONAL
INSTITUTE FOR INTERDISCIPLINARY SCIENCE AND
TECHNOLOGY, THIRUVANANTHAPURAM**

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ABSTRACT

The article pinpoints the information behaviour of scientists of the National Institute for Interdisciplinary Science and Technology, Thiruvananthapuram. The population is made up of 40 scientists under various applied branches of Science. Census method of sampling is used to represent the entire population. Questionnaire method is used as a tool to collect the data. A total of 40 questionnaires were distributed and 21 respondents had filled and returned back. The data were analyzed using SPSS software. Scientists sought information for research work. Majority of the scientists obtain information from reading electronic journals. About eleven Scientists gave first preference to scientific-technical journals. In the case of informal sources 9 scientists gave first preference to Face-to-face Discussions/Conversation with colleagues for obtaining informal sources. About 52.38% of the scientists rated abstracting and indexing service as excellent, 14 scientists preferred 'Nature' for reading and second most preferred journal is 'Environment science and Technology'. Majority of the scientists (16) preferred Science Direct database, Scirus.

Keywords: Information behaviour, Information seeking behaviour, National Institute for Interdisciplinary Science and Technology, Scientists

INTRODUCTION

The importance of information as a vital resource in today's society hardly needs emphasis as information brings users and thoughts together. It is the exchange of ideas, news and data that makes a society what it is. Seeking information is an important activity in human society. Information is a critical resource in the operation and management of organizations. Timely availability of relevant information is vital for effective performance of managerial functions such as planning, organizing, leading, and controlling. To be successful, any project requires efficient management of human and material resources. This cannot be done unless accurate, timely, and relevant information is available to decision makers. Whether it is research and development, business and industry, the information has to be acquired, processed, stored,

retrieved and disseminated for communication. Indeed the effectiveness of performance in all these spheres of activity depends largely upon the availability of information at the right time in right quantity. Information is for use. Information is a resource, persuasive and power (Bates, 1996). According to Ching – Chih Chen and Peter Hernon define information as knowledge, ideas, facts, data and imaginative works of mind which are communicated formally and or informally in any format (Binwal, 1990). Information behaviour is also the term of art used in library and information science to refer to a sub discipline that engages in a wide range of types of research conducted in order to understand the human relationship to information (Bates, 2010).

Information behaviour is a broad term which involves a set of actions that an individual takes to express information needs, seek information, evaluate and select information and finally uses this information to satisfy his/her needs. Gradually information seeking research was used to include all kinds of research on people's interaction with information. Information behaviour is found vary from profession to profession. Scientists and researchers contribute a lot to the society. Most of their discoveries and inventions have gone a long way towards making life easier (Lahoo, 2002).

Now a days electronic resource have undoubtedly some effect on the way scientists search for information. Electronic resources had gradually been incorporated in to the scientist's information seeking. The information seeking behaviour of scientists is being transformed by the availability of electronic resources for searching, retrieving, and reading scholarly materials. The escalation of journal subscription costs and limited academic library budgets have paved the way for the electronic distribution of articles. Another significant factor in the adoption of e-articles has been the ease of finding articles on the web via free search engines such as Google Scholar or from library sponsored links in online catalogs and subscribed database (Brown, 1999).

NATIONAL INSTITUTE FOR INTERDISCIPLINARY SCIENCE AND TECHNOLOGY

The National Institute for Interdisciplinary Science and Technology (NIIST), Thiruvananthapuram is a constituent laboratory of the Council of Scientific and Industrial Research (CSIR). Initially established in 1975 as a CSIR Complex, it was named as the Regional Research Laboratory in 1978 and later named as NIIST in 2007 (National Institute for Interdisciplinary Science and Technology, 2013).

REVIEW OF LITERATURE

Andrew and Lyn (2013) aimed to gain insights from existing models of information behaviour, building on them to develop a new model which, unlike most others, encompasses both information seeking and communication. A new model were proposed that includes key elements of existing models and takes into account not just the information seeker but also the communicator or information provider.

Sahu and Singh (2013) examined the different aspects of information seeking behaviour and specifically the information seeking behaviour and information needs of Indian astronomy/astrophysics academics, including the relationship between various variables such as academic, rank-wise, state wise, age wise of characteristics, and methods for keeping their knowledge up-to-date. The study concludes that astronomy/astrophysics academics were making use of e-archives for education and research.

Hemminger (2012) tried to understand how academic scientists seek information relevant to their research in today's environment of ubiquitous electronic access, a correlation framework were built and regression analysis were applied to the survey results from 2,063 academic researchers in natural science, engineering and medical science at five research universities in the United States. Overall, many factors were found to affect the specific information-seeking behaviour of scientists, including demographic, psychological, role-related, and environmental factors.

Khosrowjerdi (2011) examined information seeking and its dimensions have been analyzed and measured in different disciplines and contexts and the relationships to other variables, such as gender, task, knowledge, personality, experience, and expertise, have been measured by researchers and have yielded helpful results. Results show positive and strong relationships between these two variables.

Xuemei (2010) focused on how electronic information resources influence the information-seeking process in the social sciences and humanities, examined the information-seeking behaviour of scholars in these fields, and extended the David Ellis model of information-seeking behaviour for social scientists, which includes six characteristics: starting, chaining, browsing, differentiating, monitoring, and extracting. Based on the interview results, the researchers provides suggestions on how current information services and products can be improved to better serve social science sand humanities researchers.

Marouf (2010) described the information-seeking behaviour of the social sciences faculty at Kuwait University. The findings of this study were that these respondents heavily depend on books and journals for teaching and on a larger variety of materials for research purposes. Their uses of informal sources were comparatively less than formal sources. Among the informal sources, conferences, subject experts, and colleagues were given higher importance than librarians and government officials. Their library use is very low with complaints about the quality of staff, resources, especially in Arabic, and access to international resources.

Satish Kumar (2010) analyzed the information needs and information seeking behaviour of Defence Research and Development Organization (DRDO) scientists working in nine life science laboratories in India. Results revealed that DRDO life science scientists depend greatly on their respective library/information centers. Concludes that the working culture of the individual requiring information, the importance placed on getting it, the facilities available for seeking it, the knowledge about these facilities, the judgment of their value and the probability of getting what is wanted affects information seeking behaviour.

Hamid and Saeid (2010) evaluated interdisciplinary and the information seeking behaviour of academics from different subfields of physics and astronomy. The findings showed that the subfields that are more interdisciplinary or have a more scattered literature are more likely to use general search facilities for finding information. The study reveals interdisciplinary differences among physicists and astronomers in terms of their information-seeking behaviour and highlights the risk of overlooking the characteristics of information-seeking behaviour of specialized subject communities by focusing on very broad subject categories.

Rafiq and Ameen (2009) discussed the information seeking behaviour and satisfaction of the teachers at the National Textile University (NTU) in Pakistan, the teachers satisfaction level with NTU library facilities and services and of community members engaged in research

and development in the field of textiles. It was found that respondents used both print and digital information sources to help meet their information needs.

Miller (2008) described the results of a pilot study of the research information needs, behaviour and source preferences of academic researchers at a regional university engaged in a public policy research project. Issues emerging from the study include the development of research literacy of academics and information professionals working in complex public policy landscapes and the nature of motivating and de-motivating factors in the policy research process.

Jamali and Nicholas (2008) studied the information seeking behaviour of physicists and astronomers including methods applied for keeping up-to-date and methods used for finding articles. The study reveals differences among subfields of physics and astronomy in terms of information-seeking behaviour, highlights the need for and the value of looking at narrower subject communities within disciplines for a deeper understanding of the information behaviour of scientists.

Heinstrom (2005) tried to explore information behaviour from a psychological perspective by relating information seeking to personality traits and study approaches. Three information-seeking patterns – fast surfing, broad scanning and deep diving – emerged from the statistical analyses. Further research is recommended in order to explore the three search styles in other populations and contexts. These insights were valuable for researchers interested in user behaviour as well as for practitioners like teachers and information professionals.

RELEVANCE OF THE STUDY

The study aims at providing deep insight in to the information behavior of scientists of the National Institute for Interdisciplinary and Science and Technology (NIIST), Thiruvananthapuram. Applied researches in the field of Physics, Chemistry and Life Science are conducted in NIIST. The findings of research give valuable information of scientists information and from where they seek knowledge for their works. Survey questions were attempted to quantify scientist's transition to electronic communications, and how this affects different aspects of information seeking. The results can guide libraries and other information service organizations as they adapt to meet the needs of today's information searchers. We got deep knowledge about behavioural pattern of scientists through this study so that library sources and services can be modified to satisfy the user requirements.

OBJECTIVES

1. To identify the information requirements and characteristics of scientists.
2. To examine the types of information sources required by scientists.
3. To know the effect of information technology on users information seeking behaviour.
4. To study the level of library collection and service offered by library.
5. To identify the preference of journals and databases given by the scientists.

METHODOLOGY

To meet the objectives of the present investigation the main methods employed in data collection were extensive literature review of related studies and a questionnaire survey. The population is made up of 40 scientists under various applied branches of Science. Census

method of sampling is used to represent the entire population. Questionnaire method is used to collect the data. The questionnaire is formulated keeping in view of the objectives and various facets of the study and it is personally distributed and collected. A total of 40 questionnaires were distributed and 21 respondents had filled and returned back. The data were analyzed using SPSS software.

ANALYSIS

7.1 Purpose of Information seeking

Information seeking means seeking information for various purposes. Scientists need information for various purposes.

Table 7.1: Purpose of information seeking by the scientists

Information seeking habits	No of Scientists	Percentage
Research work	17	80.95
Observation and experiments	2	9.53
General awareness	1	4.76
Reading/ Thinking purpose	1	4.76
Preparing answers to questions	0	0
Total	21	100

The study showed that 80.95% of the scientists seek information for their research work. About 80.95% of the scientists seek information for doing their research work, 9.53% for doing observation and experiments and only 4.76% for general awareness and reading or thinking purpose.

7.2 Time spent for information gathering activities

Information gathering is a time consuming task. Some users need less time or some users need much more time for information gathering. Tables 7.2 show the response against the time taken for information gathering activities by the scientists.

Table 7.2 Time spent by scientists for information gathering activities

Information gathering activities	0-3 hrs	4-6 hrs	7-9 hrs	More than 10 hrs
Reading e-mail alerts	12 (57.14%)	7 33.33%)	0	2(9.52%)
Scanning journal articles	4 (19.05%)	4(19.05%)	3(14.29)	6 (28.57%)
Photocopying	5(23.81%)	0	0	0
Conferring with co-workers or other experts	12 (57.14%)	6 28.57%)	0	0

The analysis shows that 57.14% of the scientists spend 0-3 hrs time for reading email alerts and conferring with co-workers or other experts, 23.81% spend 0-3 hrs for photocopying and 19.05% spend 0-3 hrs and 4-6 hrs for scanning journal articles and for photocopying.

7.3 Preference of Formal Sources

The formal sources are used widely by the scientists. The scientists are requested to give their preference among the formal source. Tables 7.3 show the preference of various reference sources by the scientists.

Table 7.3: Preference of formal sources by the Scientists

Formal sources	Preference 1	2	3	4	5	6	7	8	9	10
Text books	4	5	0	2	1	5	4	0	0	2
Scientific-Technical journals/Periodicals	11	6	1	1	2	0	0	0	0	0
Reference sources	1	1	5	3	2	4	0	2	1	1
Patents/ Reports	0	2	7	4	2	4	2	2	2	2
Data sheets	0	0	0	0	0	1	2	4	2	12
Conference/Workshop/Seminar proceedings	0	0	4	2	5	2	4	0	3	0
Online Journals/database/archive	6	1	3	3	2	2	1	1	2	0
Internet/Intranet sources as Audio/ Video CD-ROM/DVD	0	6	1	1	1	3	3	4	0	0
Library catalogue	0	0	0	2	1	0	0	2	9	4
Review articles/Theses	1	2	4	3	5	1	2	4	3	0

It is seen that 5 scientists gave 2nd and 6th preference to text books, 11 scientists gave 1st preference to scientific –technical journals/ periodicals. Reference source and Patents/Reports is given to 3rd preference by (5) and (7) scientists. 12 scientists gave 10th preference to data sheets. Conference/workshop/seminar proceedings got 5th preference by 5 scientists. Then 6 scientists give 1st preference to online journals/ database/ archive. Internet/ intranet sources got 2nd preference by 6 scientists. The 9th preference (9) is given to library catalogue. Fifth preference is given to review articles/theses by 5 scientists.

7.4 Preference of informal sources

The informal sources of information are live sources which are extremely important in the process of communication. Informal sources of information provide information instantly and it is very easy to handle.

Table 7.4: Preference of informal sources by the scientists

Informal Sources	Preferences 1	2	3	4	5	6
Email/ List-server, Discussion forum etc.	1	0	7	6	2	1
Face-to-face Discussions/ Conversation with colleagues	9	10	3	1	0	0
Meetings/ Seminar/ Conference/ Workshops	3	6	3	5	3	0
Previous knowledge	4	2	3	4	3	4
Discussion with librarian or reference staff of your library	0	0	0	2	5	14
Consult a knowledgeable person in the field/ supervisor	3	3	2	3	7	1

The study revealed that 7 scientists gave 3rd preference to Email/ List-server, Discussion forum etc. The 2nd preference (10) and (6) is given to two informal sources such as face to face discussions, and meetings/seminar etc. 9 scientists gave 1st preference to previous knowledge. 14 scientists gave 6th preference to discussion with librarian and also 7 scientists gave 5th preference to consult a knowledgeable person.

7.5 Preference of Reference Sources

Most of the reference sources are ready reference sources. Ready reference sources are very useful to find information without taken much more time. The scientists are requested to give their preference among the reference source.

Table 7.5: Reference sources used by the scientists

Reference Sources	Preference 1	2	3	4	5
Dictionaries	2	4	9	5	1
Encyclopedias	8	4	4	3	3
Yearbooks	2	6	4	5	5
Bibliographies	3	8	4	5	1
Manuals	6	2	3	3	3
Total	21	21	21	21	21

The study indicated that 9 scientists gave 3rd preference to dictionaries. 8 scientists gave 1st preference to encyclopedias. 6 and 8 scientists gave 2nd and 3rd preference to yearbooks and bibliographies. At last 6 scientists gave 1st preference to manuals.

7.6 Information needs

Every person has different information needs. So users satisfy their information need through various techniques.

Table 7.6: Scientists information needs

Methods for finding information	No of Scientists	Percentage
Asking the librarian	0	0
Referring books, Journals	2	9.52
Consulting with your colleagues	1	4.76
From Internet	18	85.72
Total	21	100

The study revealed that 85.72% of the scientists find out the information from internet, 9.52% and 4.76% of them find out the information through referring books, journals and consulting with colleagues.

7.7 Information on current developments

Scientists got current developments through various sources. Information on current development is very essential for their study. Scientists need up-to-date knowledge about their area of specialisation. Thus their study got wider acceptance.

Table 7.7: Current development sources used by the scientists

Current development sources	No of scientists	Percentage
Through services from library as CAS&SDI	7	33.33
Personal communication	11	52.38
Journals/ Periodicals	9	42.86
Conference/ Seminars	13	61.90

The analysis revealed that 61.90% of the scientists obtain current information from conferences and seminars, 52.88% through personal communication and 42.86% of the respondents use journals or periodicals for obtaining current information.

7.8 Most preferred Resources

Scientist used E-Resources and Print Resources to meet their information needs. These types of resources help them to improve their study.

Table 7.8: Resources used by the scientists

Resources	No of scientists	Percentage
E- Resources	18	85.71
Print Resources	3	14.29
Total	21	100

It is observed that 85.71% of the respondents preferred e-resources for their study and only 14.29% of the scientists use print resources.

7.9 Journal articles obtained by the scientists

Scientists need journal articles for their research.

Table 7.9: Journal articles obtained by the scientists

Source of journal article	No of scientists	Percentage
Library's online/electronic version	17	80.95
Library's print subscription	4	19.05
Document delivery	0	0
Others	0	0
Total	21	100

The analysis depicts that 80.95% of the respondents collect journal article from library's online or electronic version and only 19.05% of the respondents obtain journal articles from library's print subscription.

7.10 Sections in the scientific/technical journals

Various sections in the scientific and technical journals help the scientists in various ways. From these sections they find out the materials for their study.

Table 7.10: Use of sections in the scientific and technical journals by the Scientists

Sections of journal	No of scientists	Percentage
Professional news	11	52.38
Review of progress	0	0
Original Research papers	5	23.81
Editorial comments	2	9.52
Summaries of originals papers	0	0
Advertisements	0	0
New Equipments/System products	0	0
Training and Education articles	3	14.29
Others if any	0	0
Total	21	100

It is clear that 52.38% of the scientists preferred professional news in the scientific and technical journals to find out essential matters for their study, 23.81% select original research papers, 14.29% and 9.52% of the respondents choose training and educational articles and editorial comments for their study.

7.11 Use of Information technology for storage and retrieval

Nowadays latest information technologies are used for information storage and retrieval. Proper storage of information leads to easy retrieval.

Table 7.11: Use of information technology by the scientists for storage and Retrieval

Computer and its facilities	Rarely	Sometime	Frequently	Never
Photocopying	0	3(14.29%)	10(47.62%)	0
Internet	0	0	19(90.48%)	0
Microfilm	11(52.38%)	0	0	
Digitization	6 (28.57%)	0	0	0

The study revealed that 90.48% of the scientists use internet facility frequently for information storage and retrieval, 52.38% use microfilm facility rarely and about 47.62% use photocopying facility frequently.

7.12 Usefulness of Electronic Sources

Electronic sources make it easier to gather and use information. Latest technologies help the users to searching and retrieving the information. Sometimes electronic sources make it difficult to gather and use the information.

Table 7.12: Usefulness of electronic sources by the scientists

Usefulness	Photocopying	Searching	Synthesizing	Learning
Easier	8 (38.10%)	2 (9.52%)	5 (23.81%)	6(28.57%)
More difficult	0	0	2(9.52%)	3(14.29%)
Much more difficult	0	0	0	0

The analysis shows that 38.10% of the scientists felt electronic sources easier for synthesizing and learning information than photocopying, and 9.52% felt more difficult for synthesizing the materials from electronic sources.

7.13 Library services

Nowadays various types of services are offered by library. These help the users to find the information easily.

Table 7.13: Response of scientists against the library services

Library services	Excellent	Good	Satisfactory	Poor	No services in library
Abstracting/ indexing service	11 (52.38%)	7 (33.33%)	2 (9.52%)	1 (4.76%)	0
Inter library loan	6 (28.57%)	9 (42.86%)	1 (4.76%)	3 (14.29%)	0
Newspaper clipping service	7 (33.33%)	5 (23.81%)	3 (14.29%)	5 (23.81%)	0
Reference Service	11 (52.38%)	5 (23.81%)	3 (14.29%)	1 (4.76%)	0
Reprographic service	3 (14.29%)	8 (38.10%)	2 (9.52%)	6 (28.57%)	0
Content Page Service	6 (28.57%)	3 (14.29%)	1 (4.76%)	9 (42.86%)	0

Table 7.13 shows that 52.38% of the scientists rated abstracting and indexing service as excellent, about 42.86% rated inter library loan as good, only 33.33% rated newspaper clipping service as excellent and 52.38% are satisfied with the reference service offered by library.

7.14 Ranking of Journals and Databases

To learn about how the scientists keep abreast of developments in their field they were asked to list the top 10 journals and databases they read and use on a regular basis.

Table 7.14.1: Ranking of journals by the scientists

Name of journals	Preference
Nature	14
Environment Service and Technology	8
Science	7
Journal of Alloys and Compounds	4
Biomass and Bio energy	3
Bioresource technology	3
Dalton transactions	3
Journal of composite materials	3
Journal of Materials and Materialogical Engineering	3
Physics Review letters	3

Chemical review	2
Journal of Applied Physics	2
Journal of Biological Chemistry	2
Applied and Environmental Microbiology	1
Cell	1
Journal of Basic Microbiology	1
Journal of Chemical Engineering	1
Journal of Organic Chemistry	1
Journal of pharmacology and toxicology	1
Journal of polymer science and material chemistry	1
Process Biochemistry	1

The study revealed that 14 scientists preferred 'Nature' for reading, second most preferred journal is 'Environment science and Technology', and only few of them preferred journals such as 'Applied and Environmental Microbiology', 'Journal of Chemical Engineering', 'Journal Organic Chemistry' etc.

Table 7.14.2: Ranking of databases by the scientists

Databases	Preference
Science Direct	16
Scirus	14
Scopus	9
PubMed	7
Web of knowledge	4
Web of science	3
Scifinder	3

The study showed that 16 scientists preferred Science Direct database for their search as it helps to meet the information needs of scientists, second most (14) preferred database is Scirus and only few of them (3) used Scifinder and Web of Science.

DISCUSSION

Scientists sought information for research work. Majority of the scientists spend 0-3 hrs time for reading email alerts and conferring with co-workers or other experts. Only few of them spend 0-3 hrs and 4-6 hrs for scanning journal articles and for photocopying. 11 scientists

gave 1st preference to scientific –technical journals/ periodicals. About 61.90% of the scientists obtain current information from conferences and seminars.

About 85.71% of the respondents preferred e-resources for their study. Majority of the respondents collect journal article from library's online or electronic version. About 90.48% of the scientists use internet facility frequently for information storage and retrieval. About 38.10% of the scientists felt electronic sources easier for photocopying than synthesizing and learning information.

About 52.38% of the scientists related abstracting and indexing service of the library as excellent and about 42.86% of the respondents related inter library loan as good. The study revealed that 14 scientists preferred 'Nature' for reading. Second most preferred journal is 'Environment science and Technology'. Majority of the scientists (16) preferred Science Direct database for their search, second most (14) preferred database is Scirus. Only few of them (3) used Scifinder and Web of Science.

CONCLUSION

The overall objective was to make a comprehensive study on Information behaviour of Scientists of the National Institute for Interdisciplinary Science and Technology, Trivandrum. The analysis shows that most of the users have the habit and genuine interest in reading online materials for the purpose of their study. In order to attract the users the libraries must have the collection of current periodicals and reference books. Librarians must have the essential quality to given assistance to the users in order to conduct their research. The initiatives will help libraries attract more users to utilize their resources and naturally will help to improve search behaviour of users.

REFERENCES

1. Andrew, R. & Lyn, R. (2013). Building on models of information behaviour: Linking information seeking and communication. *Journal of Documentation*, 69(2), 169-193.
2. Bates, M. J. (1996). Learning about the information seeking of interdisciplinary scholars and students. *Library Trends*, 45(2), 155–164.
3. Bates, S., Marcia, T., & Maack, M. N. (Eds). (2010). Information behaviour. In *Encyclopedia of library and information science* (3rd ed., Vol. 3, pp. 2381). London: CRC Press.
4. Binwal, J. C. (1990). *Social Science Information: Problems and Prospects*. New Delhi: Vikas Publishing House.
5. Brown, C. M. (1999). Information seeking behaviour of scientists in the electronic information age: Astronomers, chemists, mathematicians, and physicists. *Journal of the American Society for Information Science*, 50(10), 929–943.
6. Hamid R. J., & Saeid A. (2010) Google and the scholar: The role of Google in scientists' information-seeking behaviour, *Online Information Review*, 34(2), 282-294.
7. Heinström, J. (2005). Fast surfing, broad scanning and deep diving: The influence of personality and study approach on students' information-seeking behaviour. *Journal Of Documentation*, 61(2), 228-247. Doi : 10.1108/00220410510585205
8. Hemminger, A. (2010). National study of information seeking behaviour of academic researchers in the United States. *Journal Of The American Society For Information Science3 \$ Technology*, 61(5), 869-890.

9. Jamali, H. R., & Nicholas, D. (2008). Information-seeking behaviour of physicists and astronomers. *Aslib Proceedings*, 60(5), 444-462.
10. Khosrowjerdi, M., & Iranshahi, M. (2011). Prior knowledge and information-seeking behaviour of PhD and MA students. *Library & Information Science Research*, 33(4), 331-335. Doi:10.1016/j.lisr.2010.04.008
11. Lahoo, B. T. (2002). *Information Needs, Information seeking Behavior and Users*. New Delhi: ESS ESS Publication.
12. Marouf, L., & Anwar, M. A. (2010). Information-seeking behaviour of the social sciences faculty at Kuwait University. *Library Review*, 59(7), 532-547.
13. Miller, F. (2008). Research information needs of information policy oriented researchers at a Regional University: Issues emerging from a pilot study. *Australian Academic & Research Libraries*, 39(4), 253-268.
14. National Institute for interdisciplinary Science and Technology. Retrieved on Feb 15, 2013 from <http://www.niist.res.in>
15. Rafiq, M., & Ameen, K. (2009). Information Seeking Behavior and User Satisfaction of University Instructors: A case study. *Library Philosophy & Practice*, 11(1), 1-12.
16. Sahu, H., & Singh, S. (2013). Information seeking behavior of astronomy/astrophysics scientists. *Aslib Proceedings*, 65(2), 109-142. doi: 1108/00125311311319612
17. Satish Kumar, H. T., Gautam, J. N., & Vijayaraghvan, R. R. (2010). Approaches to information seeking by life scientists of Defence Research and Development Organization, India. *Annals Of Library & Information Studies*, 57(4), 17-23.
18. Xuemei, G. (2010). Information-Seeking Behavior in the Digital Age: A multidisciplinary study of academic researchers. *College & Research Libraries*, 71(5), 435-455.

