It is impossible to select articles on every possible type of scientist. For the purposes of providing coverage of the user group as well as some depth I have made some explicit exclusions. Although David Ellis' landmark article on the information seeking behavior differences between social and physical scientists is often cited, it has not been included. Many user studies following have cited his work and even suggested further study based on the model that he devised.

Of all the user groups to select scientists are, at once, the most documented and earliest researched. As early as the 1940's, studies were already being conducted on this population. The oldest article in this bibliography states that it had been collecting the data since 1966. (Garvey 1974). With all this data it is important to decide which subgroups or segments to exclude.

Many user studies have also clustered together scientists with engineers or technicians. Articles found indicate that this often is a fallacy and that the two groups, especially engineers differ in their information seeking behavior and needs, as argued by Thomas Pinelli (1991) in his article comparing the two populations. I have previously mentioned David Ellis and his work, but it is important to note that most of the studies in the bibliography cited at least one or more of his works.

For the purposes of the project, scientists will to be viewed in three or four subgroups. However as the years have gone by researchers in the Information Science field have been segmenting them into even smaller subgroups within a single discipline! In some the smaller user groups are very specific, such as the six listed in the article comparing physicists and astronomers Jamali (2008).

Starting with the physical or applied sciences we have physics, chemistry, and astronomy. Further away from the applied fields are the more theoretical areas of computer science and mathematics, which is mentioned here because it is included as one of populations in a landmark study but I will not go into detail about this particular group. Next we have the medical or basic or life science. This area includes biology, biomedical, as well pharmacy and medical. Finally we have a set of more interdisciplinary groups such as meteorologists and atmospheric scientists or also agricultural scientists. This population seems more focused in a few different disciplines and can have within it environmental scientists, geologists etc. You can see just from reading this it is not a simple task to clearly divide sciences into their own separate disciplines. In some ways this is the nature of the beast and also the beauty of it. With the dawn of the Information Age certain populations have found that they not only rely on
their colleagues for their information needs but also miss them from the library! So as information professionals we do our best to provide the scientists with their resources and know from reading these articles that it is simplistic to think that only journals are important to them and that their personal desktops are their preferred venue for satisfying their information needs.

As to the information behavior of the group itself, there is a variety amongst the disciplines. However every study stated that journals were the most consulted resource. Depending upon the date of the article, the respondents had varying preferences between using print or electronic journals. In Brown (1999) it was stated there was a preference amongst the physicists, astronomers, and chemists surveyed for journal articles in a print, as oppose to electronic format. Considering that it has been nearly ten years since this study was it is likely that that percentage of the population preferring print has shifted. The journal article has become accessible from the desktop.

Although journal articles are important to scientists for their information gathering purposes, they are not the only resource. Online database resources have an increased presence on the Internet and at academic and institutional libraries. Some of those are such as bibliographic databases and specifically citation indices are especially important to academic and research scientists.

However, even though technology for online resources is rapidly evolving the nature of science and scientific study is collaborative. Personal contacts amongst colleagues for many are vital. It is not unusual to see studies concluding that a scientist counts email as an information source. Libraries, once the center of information, have been getting fewer visits based on the fact that the desktop has been the access key to scientific information resources.

Most studies use a survey or a questionnaire to get their data. Oftentimes it is sent electronically or posted on a website. To add to the data, the researcher would sometimes interview respondents and ask specific questions regarding their library use and information needs. One of the studies Hallmark (2003) combined the two concepts in a creative way. The researcher sent personal letters select authors of meteorological or atmospheric science journal articles. She requested that they respond with how they got their necessary information to write their articles. As less studied group, it was discovered that they rely heavily on the collaborative nature of their scientific community to the point where they personally contact another author if permission or clarification is needed.
Many of research studies took place at either an academic institution or a government agency. Often the ones done at universities would include scientists in the population who are graduate students or post-doctoral students. A few of the articles discussed finding from studies done in corporate or professional settings. The information needs described were not always the same. In addition some of the findings were analyzed based upon the stage at which the scientific work or project was at.

Another method of research is the gathering of statistics from, for example, a web log or a citation system. These studies break down the data, usually by IP address and have that as the unique identifier for an individual user. The researcher creates or uses an information model to interpret the results once they have been aggregated based on specific criteria.

Once the data has been obtained based on the model or hypothesis of the study it is determined what kind of relationships, if there is one, exist between certain parameters. For example, in some studies it was observed that senior scientists would request their support staff to retrieve information for them. In other studies, not only were the respondents asked about their visits to the library but there were also asked to list the number of time in a given period they visited the building.

All the articles selected for this group are in written in English and they cover a range of dates from 1974 to 2008. As for the scope of the scholarly articles they include articles about studies done in First World countries as well as developing countries. A few the articles have sample populations from countries where English is not the dominant or official language.
Annotated Bibliography


Abstract:
“A survey of scientist users of information systems and services in a pharmaceutical research organisation was conducted, primarily by semi-structured interview, with the primary aim of assessing, and where possible quantifying, the changes in information-related behaviour resulting from the provision of desktop information systems. Difficulties were encountered due to the great difference in the nature of work which has occurred simultaneous with, and to a degree due to, improvements in the information environment, where information tools are now central to scientific work. The results cast light on the changing nature of information handling in the new environment, and on specific issues of the ‘information gatekeeper’, information overload, and information literacy. A cluster analysis of the results showed three distinct groups of users, ‘perfectionists’, ‘pragmatists’ and ‘positivists’, the grouping likely to result from personality factors.” [Article Abstract]

Search strategy: Dialog database, Social SciSearch (File 7)
Search method: keyword search
Search string: USER STUDIES AND SCIENCE AND SCIENTIST

Annotation
I want include articles about user studies that has been done in professional research environments as well as academic ones. Though focused on desktop usage by scientists at a pharmaceutical company in the UK, this article should be included as electronic resources are becoming the status quo for scientific researchers. Increasingly, scientists rely on desktops to access libraries and information centers, thereby causing visits to the physical library to continue decreasing. I also include this article since not many of the scholars classify their user groups by personality: pragmatists, perfectioniont, and positivists. This study is eight years old and mentions that the participants surveyed see positive changes in the last 5 years: more overall access to resources online and at the desktop, more information available in general. The lost art of browsing, the missing feeling of personal contacts, and lack of visits to the library...
causing to lose its status as a ‘thinking-place’ are qualities that come from the move to the desktop as the key access to information resources.


**Abstract:**
“The information seeking behavior of astronomers, chemists, mathematicians, and physicists at the University of Oklahoma was assessed using an electronically distributed questionnaire. All of the scientists surveyed relied greatly on the journal literature to support their research and creative activities. The mathematicians surveyed indicated an additional reliance on monographs, preprints, and attendance at conferences and personal communication to support their research activities. Similarly, all scientists responding scanned the latest issues of journals to keep abreast of current developments in their fields, with the mathematicians again reporting attendance at conferences and personal communication. Despite an expression by the scientists for more electronic services, the majority preferred access to journal articles in a print, rather than an electronic, form. The primary deficit in library services appeared to be in access to electronic bibliographic databases. The data suggest that a primary goal of science libraries is to obtain access to as many appropriate electronic bibliographic finding aids and databases possible. Although the results imply the ultimate demise of the printed bibliographic reference tool, they underscore the continued importance to scientists of the printed peer-reviewed journal article.” [Article Abstract]

**Search strategy:** I started wanting to search online databases first to see what search strings would work best

**Search method:** online database ProQuest Research Library keyword search

**Search string:** User studies (citation and document text) OR Information seeking (citation and abstract) AND scientists (Abstract)

**Annotation**
I had to include this article because it has been cited in so many others regarding the same topic. Scientists of the quantitative disciplines still prefer printed journals and rely
on personal contacts in their information seeking. Like other studies a lack of access to certain electronic resources remains a problem. Nearly ten years old and yet the issues of space for printed journal articles remain. Scientists surveyed rely heavily on print or electronic journals but also desire more access to bibliographic and/or citation databases even though not all were known to them, except ISI. This warrants a lack of oversight and the author suggests an awareness project as well as training for the scientists interested in using those additional previously unknown resources. Of the academic scientists and mathematicians surveyed it was interesting to note the 92% of them where male and 8% female. Considering the previous annotation regarding personality this may be something to take into consideration but it is not further mentioned probably because the sample was too small to make a significant difference.


Abstract

“This study reports an analysis of referral URL data by the Cornell University IP address from the American Chemical Society servers. The goal of this work is to better understand the tools used and pathways taken when scientists connect to electronic journals. While various methods of referral were identified in this study, most individuals were referred infrequently and followed few and consistent pathways each time they connected. The relationship between the number and types of referrals followed an inverse-square law. Whereas the majority of referrals came from established finding tools (library catalog, library e-journal list, and bibliographic databases), a substantial number of referrals originated from generic Web searches. Scientists are also relying on local alternatives or substitutes such as departmental or personal Web pages with lists of linked publications. The use of electronic mail as a method to refer scientists directly to online articles may be greatly underestimated. Implications for the development of redundant library services such as e-journal lists and the practice of publishers to allow linking from other resources are discussed.” [Article Abstract]

Search Strategy: Using one of the online databases I decided to search
From the ProQuest Interdisciplinary Database using the Advanced Search I used the following search string for the criteria listed in parentheses.

Research Library Core, Sciences Module, Social Science Module
And this was for scholarly peer-reviewed journals only for all dates

Search method: keyword and controlled vocabulary
Search string: (user studies) OR ENHAI(information seeking) AND ABS/scientists)

Annotation
Rather than analyze data results from questionnaires or surveys this user study retrieves log data from servers about users’ activities. Like some of the other articles email is a listed a source for referrals. There is redundancy in the methods of getting access to articles, such as one library website will have an e-journal list, but the researcher will also have their own list on their personal website. What was most interesting is that users accessing the ACS site relied on ‘few but consistent methods’.


Abstract
“The study explores the role of information and information seeking in the Research and Development Department of an international oil and gas company. The information seeking patterns of engineers and scientists at Statoil’s Research Centre, in Trondheim, Norway were studied in relation to their research activities in different phases and types of projects. The project phases were evaluation of alternative solutions; development and testing; and summary of experiences. The project types were incremental; radical; and fundamental. Eight major characteristics were identified in the patterns; surveying; chaining; monitoring; browsing; distinguishing, filtering; extracting and ending. The study analyses the requirements for different types of information in an environment where the need for internal and external resources are intertwined; it also compares features of the information seeking patterns of engineers and research scientists from this and previous studies. It was found that, although there were differences in the features of the information seeking patterns of the research scientists and engineers, the behavioural characteristics were similar; and the study identified identical or very similar categories
of information seeking behaviour to those of previous studies of academic researchers.”

[Article Abstract]

Search strategy: Browsing
Out of personal interest I was reading an article that resulted from a search I had done on EBSCOHost about information seeking behavior of women IT professionals. Since until recently I was part of that user group I skimmed it and went to the reference list and saw the article below.

Search method
No search string for this particular article, however after finding the article by Chun Wei Choo, and Christine Marton entitled Information seeking on the Web by Women in IT professions from Internet Research: Electronic Networking Applications and Policy I did use footnote chasing and found the Ellis article in the references list.

Annotation
I am including this article because 1) it discusses scientists as separate from engineers 2) it discusses information seeking behavior in the context of projects 3) the study ran in an industrial setting and 4) David Ellis is a well-known author of user studies. None of the other articles in this bibliography cover project progression. Not current and web resources as well as online databases have changed were this study done again the results may be different.


Abstract
“Six faculty members in the Department of Chemistry and Biochemistry at the University of Texas at Austin were interviewed one-on-one to gather information about their information-seeking behavior, favored resources, and opinions about the transition from a print to an electronic information environment. In most cases, these chemistry faculty members have eagerly embraced the enhanced access to chemical information made possible by the steady addition of electronic journals and networked database systems. The most-cited benefits include significant time-saving and convenience as well as access to more journals
than ever. As a result, use of the physical library and its printed collections by faculty is declining. Chemistry faculty interviewed expressed a strong self-reliance in their information-seeking skills and showed sophistication in their choice of tools.” [Article copies available for a fee from The Haworth Document Delivery Service: 1-800-HAWORTH. E-mail address: <docdelivery@haworthpress.com> Website: <http://www.HaworthPress.com> © 2001 by The Haworth Press, Inc. All rights reserved.]

Search strategy: Decided to see what I could find in the “DeepWeb”

Search method: Clustered Index Search on www.clusty.com

Search string: “information-seeking” + “scientists” + “researchers”

2 links resulted that could be good for this assignment

Annotation

Of all the studies referred to in the articles this one had the smallest sample size and is more personal in its data gathering method. Like in other disciplines not all information needs of chemists are alike. Also though moving to electronic resources is continuing to happen, some smaller academic libraries cannot afford the subscription rates and continue to have CA available in print. In addition, libraries need a variety of information tools available so that if databases like SciFinder Scholar are not sufficient other tools can be used.


Information and Storage Retrieval, 10, 115-131.

Abstract

“In this article we examine the concept of the ‘information user’ and attempt to described some of the dynamics of the situation by discussing some of our data relative to ‘intraindividual variations’ (changes which occur within individual scientists as their scientific work progresses) and ‘interindividual variations’ (physical vs. social scientists, basic vs. applied scientists, experienced vs. inexperienced scientists, and scientists working in the same subject-matter area vs scientists who recently changed their areas.) All of these were found to produce significant variation in the information needs of scientists and in the sources they used to satisfy these needs. Some implication of these findings relative to information technology are discussed. “ [Article Abstract]
**Search strategy:** Online database search in Dialog using OneSearch Files 1,2  
**Search method:** key words with proximity operators and truncation  
**Search string:**  
(ACADEMIC? OR RESEARCHER) AND SCIENTISTS AND  
(USE()STUD? OR INFO()SEEK?)

**Annotation**

Although the oldest on the list it’s the oldest in existence. Studies on this user group go back to even the 1940’s. I want to include this one because it is another important article that gets cited and can show how much scientific information usage has changed or not. Similar to the Ellis (1997) article the stage to stage progression of scientific research was the context of the information seeking behavior surveyed. Although the sample for the study include social scientists I felt that this article was important to include for its discussion of comparisons of the types of scientific information seeking behavior.

*Journal of the Medical Library Association, 95,* 426-434.

**Search strategy:** Online search of Dialog File 438  
**Search method:** controlled vocabulary and truncation  
**Search string:**  
(INFO? OR SEEK?) AND (SCIENTIST? OR RESEARCH OR ACADEMIC) AND PY >=2000  
AND SEEK? AND NEEDS/DE OR NEEDS/TI AND LIBRARY AND RESEARCH? AND STUDY

**Abstract**

“Objective: An information needs study of clinical specialists and biomedical researchers was conducted at the US National Institutes of Health (NIH) to information library services and contribute to a broader understanding of information use in academic and research settings.

Methods: A random stratified sample by job category of 500 NIH scientists was surveyed by telephone by an independent consultant using a standardized information industry
instrument, augmented with locally developed questions. Results were analyzed for statistical significance using $t$-tests and chi square. Findings were compared with published studies and an aggregated dataset of information users in business, government, and healthcare from Outsell.

Results: The study results highlighted similarities and differences with other studies and the industry standard, providing insights into user preferences, including new technologies. NIH scientists overwhelmingly used the NIH Library (424/500), began their searches at the library’s Website rather than Google ($p \leq 0.001$, were likely to seek information themselves (474/500), and valued desktop resources and services.

Conclusion: While NIH staff work in a unique setting, they share some information characteristics with other researchers. The findings underscored the need to continue assessing specialized needs and seek innovative solutions. The study led to improvements or expansion of services such as developing a Website search engine, organizing gene sequence data, and assisting with manuscript preparation.” [ Article Abstract ]

**Search strategy:** Online database Dialog File 483 (Library Lit & Info. Science)

**Search method:** key word searching with proximity operators and truncation

**Search string:** (ACADEMIC? OR RESEARCHER) AND SCIENTISTS AND (USE()STUD? OR INFO()SEEK?)

**Annotation**

Although this study included disciplines that are not part of the user group for this bibliography, they were segregated. I wanted to include this article for the fact that it studies biomedical scientists and it was also one of the few that took place in a government setting. Most importantly, it actually helped improve services for the user group.

Abstract

“This study describes the methods of access and retrieval of journal articles that were cited during 2000-2001 by atmospheric scientists from universities, federal government agencies, and private research institutes. Citations to articles originally published during 1995-2000 were chosen from the bibliographies of current articles published in eight journals in the atmospheric sciences. Each of one hundred authors received a personalized letter and brief questionnaire that address methods of access and retrieval of one of their cited articles. A large majority of those participating in the study reported that they used traditional (non-electronic) methods for both access and retrieval of that particular citation. Participants were also asked to comment on problems encountered in using electronic journals as well as problems with access and use of data for their research. Results provide a snapshot of the current information-seeking behavior of these scientists. The return rate of 61% suggests a high level of concern for their journal literature in this user community.” [Article Abstract]

Search strategy: database search is CSA Illumina LISA
Search method: using controlled vocabulary descriptors
Search string: DE =((user studies) or (information seeking) or (behavior) and scientists

Annotation

The article clearly states that the meteorological scientists are much more interdisciplinary than those scientists in subjects like chemistry. Like all other scientists there is a heavy reliance on journals. However there is an issue with access based on affiliation. Those who do not have access either use the library and get the monograph or even go so far as to get permission to obtain a copy from the author. This was not mentioned in the other scholarly articles that I read! Those who have access enjoy the convenience of electronic journals but lament the sometimes poorer quality of the graphics or images therein.

Abstract

“The information seeking behavior of academic scientists is being transformed by the availability of electronic resources for searching, retrieving, and reading scholarly materials. A census survey was conducted of academic science researchers at the University of North Carolina at Chapel Hill to capture their current information seeking behavior. Nine hundred two subjects (26%) completed responses to a 15-minute Web-based survey. The survey questions were designed to quantify the transition to electronic communications and how this affects different aspects of information seeking. Significant changes in information seeking behavior were found, including increased reliance on web based resources, fewer visits to the library, and almost entirely electronic communication of information. The results can guide libraries and other information service organizations as they adapt to meet the needs of today’s information searchers. Simple descriptive statistics are reported for the individual questions. Additionally, analysis of results is broken out by basic science and medical science departments. The survey tool and protocol used in this study have been adopted for use in a nationwide survey of the information seeking behavior of academic scientists.”

[Article Abstract]

Search strategy: Using the online database ProQuest Research Library
Search method: keyword and controlled vocabulary
Search string: (user studies) OR ENHAI(information seeking) AND ABS(scientists)

Annotation

Although the article is dated 2007 the survey included is continuing until 2009 as discussed and verified on the author’s website which is listed in the text. Mention of access to online electronic resources is changing the way that scientists actually do their work. Here it mentions also the use of collaborative group communications software used in the general public that exists in the shape of tools like open access journals, open peer review, and other tools for sharing annotations and bibliographic databases.

Abstract
Purpose – The study aims to examine two aspects of information seeking behaviour of physicists and astronomers including methods applied for keeping up-to-date and methods used for finding articles. The relationship between academic status and research field of users with their information seeking behaviour was investigated.
Design/methodology/approach – Data were gathered using a questionnaire survey of PhD students and staff of the Department of Physics and Astronomy at University College London; 114 people (47.1 per cent response rate) participated in the survey.
Findings – 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.
Originality/value – The study is the first to deeply investigate intradisciplinary dissimilarities of information-seeking behaviour of scientists in a discipline. It is also an up-to-date account of information seeking behaviour of physicists and astronomers.
Keywords Physics, Astronomy, Information searches, User studies, Behaviour
Paper type Research paper

Search Strategy: Decided to browse the most recent issues of the Journal of Documentation. This took me to the EmeraldSight search database.
With 2262 results I checked the first 5 pages:
Search method: keyword search
Search string: All fields / information seeking and scientists / All fields

Annotation
This article breaks into group the physicists surveyed. It was found that there are differences within subgroups of physicists. The article divided the groups in 6 as the following: Atmospheric Physics, High Energy Physics, Condensed Matter and Materials Physics, Astronomy and Astrophysics, Theoretical Molecular Physics, Atomic, Molecular, Optical, and Positron Physics, and Optical Science Laboratory. This could be a great article to contrast with Brown (1999) with respect to physicists and astronomers.

Abstract
“Knowledge about the information needs and seeking behavior of scientists could play a vital role in meeting their information needs effectively. Libraries can use this knowledge for re-orienting their collections and facilities to attune them to the needs of the scientific community. This study explores information needs and seeking behavior of Malaysian agricultural scientists. It was found that research scientists spent 16% of their office time on reading and literature searching, whereas academicians spent 9.3% of their time for this purpose. The study also revealed that scientists preferred using primary sources of information, particularly journal and review articles. Informal communication with professional colleagues was also considered important for exchanging current research information. A large number of the participants felt that they had not been keeping in touch with scientific literature due to deficient library collections and services. This article recommends that science and technology libraries should periodically survey the information needs of their users, assess their collections and facilities, and strengthen their promotional activities.” [Article Abstract]

Search strategy: Originally wanted to citation searches in Dialog and decided to use File 7 (SocSci Search)
Search method: keyword with controlled vocabulary, proximity operators, and truncation
Search string: information()seek? OR user stud?/DE and (behavior OR behaviour) AND scient?/TI

Annotation
This article has been included due to it’s coverage of agricultural scientists in a developing country and how their research is directly related to the future of their GDP, considering that many developing countries are much more agrarian based economies. The top three usages were journal articles, review articles and professional colleagues. Interesting to note that in this study and that of the physicists, astronomers and mathematicians the emphasis on personal colleagues was important to each user group. What was unsettling was the percentage of respondents who felt that they did not have
all the resources or access needed. At 43% that is a high number. Also unusual about this study is the very high number of responses, in some cases over 70% for certain categories. Importantly this study also did cross tabulations between categories such as gender, number / frequency of visits to the library and also other areas like, age and how they spend their time and if they have the scientific literature that they need.

*Science and Technology Libraries, Spring*, 5-25.

**Abstract**
Many user studies in information science have grouped together scientists and engineers. This article is written to show that this is a gross error in judgment and that fundamentally the two groups are different and yet in some ways connected. Essentially scientists are involved in making new discoveries or connections and conducting research and publishing their findings. On the other hand engineers are focused on producing a product or new program, sometimes based on the finding of the scientists. Here it is stated that science is an ‘introverted’ activity versus technology being ‘extroverted’.

**Search Strategy:** Dialog database File 438  
Browsing  
**Search method:** I was looking for the article by Victoria Welborn that I had found in Dialog using keyword searching, found it, read it and realized it didn’t cover at all what I needed but I found another much more appropriate article in the same issue.  
**Search string:** BEHAVI?/DE OR BEHAVIOR/TI OR BEHAVIOR/AB AND SCIENTISTS

**Annotation**
With this article having been written in 1991 it seems following further investigation that some information-seeking behavior studies are still in this mode of clumping. Some articles discussed the information seeking behavior of scientists and engineers together. After reading the article below I decided that based on the reasons discussed that there is a significant difference between the roles and definitions of scientists and engineers and that they should not have their behavior data clustered as a single group.

**Abstract**

“Continuing change in the provision of, and access to, scientific information has stimulated interest in the nature of current information usage by scientists. Recent studies have looked at this question in terms of science as a whole. The present study complements these by concentrating on the biological sciences only. It surveys research information usage in four institutions - a university agricultural faculty, a university school of biology, a government research establishment and a pharmaceutical laboratory - and complements a study of information technology usage by biological researchers which has already appeared. It is found that biologists have a spread of information needs which parallels in its diversity that of all the sciences taken together. Changes in information-handling in biology are occurring, but to differing extents, depending on the institution and the biological specialism." [Article Abstract]

**Search strategy:** Online database search of CSA Illumina LISA Database

**Search method:** keywords and controlled vocabulary

**Search string:** DE=((user studies) or (information seeking) or behavior) and scientists

**Annotation**

I wanted to include this article because it’s another one that segregates from within in a subgroup of the scientists. Over ten years old this study still provides some interesting data especially with regard to seniority of respondents as it relates to information seeking behavior and preference of information resources.

Abstract

“This study explored the bibliographic and documentary information-seeking behavior of high-level research scientists in the context of ever-developing online bibliographic and documentary information (BDI) resources. Descriptive data were obtained from a nationwide sample of French neuroscience researchers using individual questionnaires, followed by semistructured interviews. French neuroscientists often use online BDI resources instead of indexes and other print resources for bibliographic and documentary searches. The most popular online BDI resources among neuroscientists are the PubMed database and the Google™ search engine, which neuroscience experts described as essential for their work. The participants used them with a wide variety of objectives, such as acquiring new knowledge, finding out about experimental techniques, monitoring publications in their field, looking for information to fuel scientific debate, or retrieving teaching resources. Time constraints appear to be a decisive factor when it comes to determining the usefulness of a BDI resource. This study suggests that when research scientists can access efficient and exhaustive online BDI resources, those resources quickly become their preferred way of getting work-related information. Hence, direct collaboration of scientists and scholars with librarians and information specialists to put together online BDI resources that include convenient databases and search engines appears essential. On the other hand, formal training on those specialized online information resources should be introduced in graduate courses. In addition, introducing easily accessible, online tutorials that can adapt themselves to the needs of individual users might alleviate the difficulties users encountered with these systems.” © 2007 Elsevier Inc. All rights reserved. [Article Abstract]

Search strategy: Online database search

Search method: keywords with controlled vocabulary proximity operators and truncation

Search string: information()seek? OR user stud?/DE and (behavior OR behaviour) AND scient?/TI

Annotation

To add balance this bibliography I include this article because the study focused on electronic resources, took place in a developed country at research centers where English is not the predominant language and the results were surprising. Although the level of research in progress at these institutions very high, Google, not even
Google Scholar, second in the list of information resources. Ease of use predominantly was the reason for this. Thus France seems to be behind in training its students, especially PhDs, and researchers on how to best use BDI resources, such as PubMed.


Abstract:
“Little attention has been focused on the information needs and information-seeking behavior of health science professionals in developing countries particularly in Malaysia. This study explores the information needs and seeking behavior of biomedical scientists at the Institute for Medical Research (IMS), Malaysia, the oldest and leading medical research center in the country. A total of 84 questionnaires were distributed to the biomedical scientists and 54 filled-in questionnaires were returned with an overall response rate of 64.3 percent. The findings indicated that biomedical scientists use a variety of information sources to satisfy their information needs. Biomedical scientists who were solely involved in research work considered journal articles as the more preferred information source. On the other hand, researcher-cum-lecturers considered books as the most preferred information source in meeting their information needs. Both categories of scientists also considered interaction with colleagues as an important source for satisfying their information needs. The study also revealed that in spite of having access to modern and up-to-date digital information sources, most respondents still preferred using printed materials. Nonetheless, CD-ROM was the most utilized IT-based source. For the Internet-based information sources and applications, e-mail was the most popular while other applications were used infrequently.” [Article Abstract]

Search strategy: Searched CSA Illumina LISA Database
Search method: searched using controlled vocabulary (keywords)
Search string: DE=((user studies) or (information seeking) or behavior) and scientists

Annotation
Many of the articles refer to studies that were done in the mid 1990’s. Malaysia is just one of the non-Western countries with this research happening. The second author of this study also was the second author for another study done at the IMR on biomedical scientists also in Malaysia, which I have included in this listing. Segregating results based on whether or not a scientist is in involved in research or teaching is not something seen in most of the other articles. In addition the respondents considered the library facilities and access to materials to be problematic.
Recommended Resources for Scientists

MEDLINE
MEDLINE® (Medical Literature Analysis and Retrieval System Online)

**Annotation**
Over 16 million references to journal articles mostly focused on biomedicine are in this database. In addition it has its own subject headings, indexed with NLM's Medical Subject Headings (MeSH®). This database is one of the de facto standards of the medical industry. With it own thesaurus it is an excellent resources for biological researchers or biomedical scientists.

PubMed, [www.pubmed.gov](http://www.pubmed.gov)

**Annotation**
PubMed is a portion of the database MEDLINE that provides free access to users. The studies from developing countries with biomedical scientists often cited PubMed as their resource of choice. For the biomedical scientists in developing countries whose institutions cannot afford the cost of subscription this is an excellent resource.

Physical Review Letters, American Physical Society

**Annotation**
This journal features short, important papers from all aspects of the physics discipline. It is highly regarded as an information source for within the scientific community. It was listed in the articles as one of the most important resources for keeping current with all the developments in the community. However, if a smaller institution would require access they would probably only get it online as the price is very high.

SciFinder Scholar, Chemical Abstract Service, A division of the American Chemical Society

**Annotation**
This tool enables searches to find not only journal articles, but also patents. There is a separate component for searching chemical reactions. Sequences combined from CAS and GenBank® databases, which are indexed and linked to
scientific journal and patent literature. There is also within it the CAS database which is the most authoritative source for chemical substance information.

Web of Science®
http://www.thomsonreuters.com/products_services/scientific/Web_of_Science

Annotation
In Brown (1999) some respondents suggested that Science Citation Index be offered and available online to assist in finding older information. That is now a reality. The citation index is very useful to all academic and research scientists in doing such tasks as preparing literature reviews for upcoming journal articles or keeping aware of the fields' prolific authors. Unfortunately not all journals are indexed in this database. It would be important to verify that the journal being inquired exists in the database.

Summary
Until I had begun searching for articles for this bibliography I had no idea that scientists are one of the most and earliest studied user groups. This was both a blessing and a frustration. As there is a lot of information available about scientists, it took some digging to determine whether the article would qualify. Some articles included engineers or technicians in their user groups and I only included those that actually segregated their data results because that way I knew that they could be documented and also mentioned in the conclusions.

During the searching process I made use of the citations indices. However, the results were not as fruitful as I had expected. For the author Thomas Pinelli, I decided that some other authors may have cited his work as well. That was true and although article found discussed scientists and their information seeking behavior and usage it included social scientists as well as applied and basic scientists. Furthermore, the results of the surveys were not segregated by type of scientists or even subgroup. Thus I didn’t include it.

The information needs and information seeking behavior of agricultural scientists in Malaysia Library and Information Science Research

Found using a DIALOG search
File 7 Information()seek? OR user stud?/DE and (behavior OR behaviour) AND scient?/TI
There was an article that I found by the same author on a slightly different user group and it had engineers included so I did not include it in the bibliography. This article focused clearly on this one group and I felt it fit the criteria.

In continuing to research this topic and out of curiosity I wanted to learn more about ‘current awareness’ and scientists, what better way than to read another scholarly article. I used GoogleScholar and typed in the following search string: “current awareness”+ “scientist” and got an article that looked interesting and is by Julie Hallmark. From that site www.cat.inist.fr I got more information about it. It wasn’t exactly what I was looking for so I decided to see if I could search the cat.inist site for just “Julie Hallmark” there it uses GoogleScholar Custom search and I got an article entitled, Information-seeking behavior of academic meteorologists and the role of information specialists. This article was also from Science & Techology Libraries and year 2001!! But this time volume 21!