Contents:

- What is literature?
- Objectives of a literature search (review).
- Types of Literature.
- Where to find literature? Library vs. Internet.
- Initial search: Where to start from?
- How to do an efficient and effective literature search?
- Developing search and reading strategies.
- How to search for all the books published in your field?
- How to search for all research articles on your research topic? What are citation indices or databases?
- How to use ISI Web of Science?
- What is Cited References Search and how to do it?
- Using "EndNote" as a very handy tool for automated archiving, organizing, sharing, citing and formatting your reference collection.
- ISI Master Journal List (MIL) Search.
- Journal selection criteria for reading and for publication.
- How to use the Journal Citation Reports?

What is literature?

According to Encyclopedia Britannica it is "a body of written works". Concise Oxford English Dictionary adds "... books and writings on a particular subject" to this definition.

The written works include:

- books
- scholarly journals
- research papers
- theses
- abstracts
- indexes
- bibliographies
- encyclopedias
- handbooks
- maps
- conference proceedings
- specific sources like laws or standards
- official statistics

Following literature can also be used with "extreme precaution" as part of scientific search:

- Internet.
  Most of the information in internet are out of commercial or advertorial concerns. Therefore, sorting out the reliable sites in internet may require experience and expertise.

- Newspapers.
  Newspapers do not intend to publish "purely scientific" articles. Therefore it is often not regarded as part of scientific literature. However, they can be used very cautiously in social sciences for very specific purposes.

- Scientific magazine journals.
They are usually published to increase the scientific awareness of their readers on a specific field of concentration. There may be useful reviews in these journals, but they are never complete, lack original research, and they are usually profit oriented.

The distinction between the magazines and true research journals is the "absence of advertisements" in the scholarly research journals. That is the reason why subscription to these journals is very expensive as much as several thousand dollars a year.

• Unpublished work through mutual communication.

One may have contact and have interviews with individual authors and ask for access to unpublished documents. Publication of data or opinions gathered this way requires the consent of the original author, and citing in the references section of the published work.

Objectives of a literature search (review).

A graduate student should spend a considerable amount of time for reviewing the literature. "Research" and "literature" should go hand-in-hand in a healthy research.

In order to save time, you should know what you are looking for. Therefore, it is better to begin by defining the exact purpose(s) of your literature search so that you can begin your search with a specific objective. When making a literature search as part of the research process, you have three primary objectives. After completing the literature search you will want to be able to:

• establish the state of the art (enable you to familiarize with existing knowledge and understanding of your topic.)

• identify deficiencies in current knowledge (reveal previously unknown or unfamiliar sources of data and related research)

• critically assess the most fruitful direction(s) for future research. (get entirely new ideas and approaches to the problem, evaluate and compare your research with accepted research standards)

You need a good literature review because it:

• demonstrates that you know the field.

This means more than reporting what you've read and understood. Instead, you need to read it critically and to write in such a way that shows you have a feel for the area; you know what the most important issues are and their relevance to your work, you know the controversies, you know what's neglected, you have the anticipation of where it's being taken. All this would allow you to map the field and position your research within the context.

• justifies the reason for your research.

This is closely connected with demonstrating that you know the field. It is the knowledge of your field which allows you to identify the gap which your research could fill. However, it is not enough to find a gap. You also have to be able to convince your reader that what you are doing is important and needs to be done.

• allows you to establish your theoretical framework and methodological focus.

Even if you are proposing a new theory or a new method, you are doing so in relation to what has been done.

• The literature review becomes your springboard for the whole thesis.

Never forget that keeping a close contact to the literature saves time “Two hours in the library can save six months in the laboratory”
Types of Literature.

Literature can be classified as primary, secondary and tertiary literature as shown in the following diagram:

- **IDEA**
  - **RESEARCH**
    - **CONFERENCE**
    - **PREPRINTS**
    - **PROCEEDINGS**
    - **JOURNAL ARTICLES**
      - **PATENTS, DISSERTATIONS, THESIS, GOVERNMENT & TECHNICAL REPORTS**
      - **TABLE OF CONTENTS & INDEXES** (1 Month)
      - **SUBJECT INDEXES** (1-3 Months)
      - **ABSTRACTS** (3-6 Months)
      - **REVIEW ARTICLES** (1-3 Years)

- **INFORMAL COMMUNICATION**

- **PRIMARY LITERATURE**

- **SECONDARY LITERATURE**

- **TERTIARY LITERATURE**

Everything else: 2+ Years - books, handbooks, encyclopedias, dictionaries, textbooks

At this electronic age, the lifecycles shown are shorter. Any article can now be on the desks of the readers through internet as soon as their manuscripts are accepted for publication, and their proof readings are complete.

Where to find literature? Library vs. Internet.

In the past, a considerable portion of time (say at least 3 months) of a graduate study had to be spend in Library. This time was much more for those studying in the theoretical fields or social sciences.

There were (and still are) famous University Libraries equipped with most up-to-date book and journal collections. But this is an expensive business. The cost of a printed material is high. The price of rare scientific books and journals are already much higher than the prices of popular books or magazines. Therefore operating a library rich in books and journals is extremely expensive. Therefore one can find any printed material only in some famous libraries like Oxford Library, or Harvard. Libraries of METU and Bilkent Universities in Ankara also served as a reasonably good source of information to the researchers from all universities in Turkey.

But eventually, with the explosive advance of internet technologies, and a similar adaptation of publishing companies to this speed, almost all printed material became available in internet in electronic form. Electronic versions are much cheaper. Subscriptions to the so-called full-text versions of especially scientific journals became more affordable for the University libraries.

Subscription costs further decreased with mass subscriptions through consortia formed by combining the financial recourses of different universities.

ANKOS (Anatolian University Libraries Consortium), for example, serves as a common platform for searching and downloading a few thousand journals published world-wide for its member universities including Eastern Mediterranean University. Hence, the cost of subscriptions for a university drops down to a few hundred thousand dollars unless otherwise it would be say a few million dollars.
e-Books are getting more and more common. Some high-schools in the United States are giving tablet computers with e-copies of the text-books to their students to avoid carrying the books everyday to school.

All common encyclopedias, handbooks and dictionaries have internet versions with reasonable subscription prices. These internet versions provide additional features like automatic searching, being up-to-date, copying and pasting, sorting etc.

It is obvious that new generation researchers can get access to almost all literature from their homes or offices. But still libraries are being used especially for rare collections which are not available in electronic medium yet.

**Initial search: Where to start from?**

General rule is that: Start with general information sources, hence, gain some broad background, and proceed with specific information sources.

<table>
<thead>
<tr>
<th>General Information Sources (mainly tertiary literature)</th>
<th>Specific Information Sources (mainly primary literature)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Textbooks</td>
<td>Citation Indexes</td>
</tr>
<tr>
<td>Encyclopedias</td>
<td>Abstracts</td>
</tr>
<tr>
<td>Research reviews</td>
<td>Source Documents (journal articles, conference proceedings etc)</td>
</tr>
<tr>
<td>Handbooks</td>
<td></td>
</tr>
<tr>
<td>Guides</td>
<td></td>
</tr>
<tr>
<td>WEB Pages</td>
<td></td>
</tr>
<tr>
<td>Review articles (&quot;Advances in...&quot;)</td>
<td></td>
</tr>
</tbody>
</table>

Starting with specific information sources focus on very narrow fields of concentration. They usually do not provide a background since they assume that the readers already have it. These articles use advanced terminology and a technical style for expression of scientific arguments. They focus on very narrow fields of concentration therefore, reading some "general information sources" prior to your detailed search will prepare you by equipping the necessary reading skills in science. Otherwise, there is always a risk for losing your self-confidence in following the literature if you directly start with very specific articles.

Plus, reading general information sources first will give a direction about where to find more specific information on a given topic. Their list of references will help you for spotting the sources (bibliographic data) of the articles you could read.

**How to do an efficient and effective literature search?**

Here are some hints on efficient and effective use of library.

- **Orient yourself with the library layout.**
  
  Visit the library and learn what is available for you.
  
  Learn where are the "references", "books", "periodicals", "CD collection", and "special collections" sections are located in the building. Go ahead and have a quick tour in these sections.
  
  References section includes dictionaries, encyclopedias, handbooks, almanacs, atlases, books of biographies, and many other very general information resources. Borrowing books from the references section overnight is very limited, if not impossible.
Periodicals include periodically published journals, magazines, indices and abstracting systems like "current contents" or "chemical abstracts". Usually the latest issues are available on the shelves. You have to ask the librarian to get access to the back issues of a journal. Periodicals can not be borrowed. Use copy machines whenever necessary.

- **Own a library card.**
  Visit the membership desk, and apply for a library card if you have not done yet. It is impossible to borrow a book without it.

Borrowing system in our university library is very flexible. Make use of it, but please don't abuse it: try to return the borrowed books before the allowed time period such that others can also benefit from them.

Never exceed the due dates for borrowed books, otherwise you may be asked to pay high amounts of penalties.

- **Get acquainted with the cataloguing system.**
  All big libraries use a systematic cataloguing system for distribution of the books and periodicals among the shelves. o ahead and learn which cataloguing system is used in our library, and how it is used to find the books and periodicals on the shelves.

- **Learn how to use the on-line or card catalog system to check for the availability of the books in the library.**
  Card catalog system is usually at the entrance of the library. You can usually do search from the title catalogue, or "author catalogue" or other catalogues if available. These catalogues include a card for each book available in the library. Find the book you are looking for and record its so-called "call number" from the card. This call number is a number developed by using the principles of the cataloging system of the library. Then look for the book in the shelves by being guided by this call number.

The use of on-line system is more efficient than using the card system. It does not only show you the availability of the book in the library but also shows if it has been checked out by other users. This way you can trace the borrower, and share a desired book for urgent cases.

Please save some time for exploring the both systems.

- **Be aware of the "interlibrary loan system" for the books that are not available in the library.**
  The librarians may help you to borrow a book from other libraries abroad free of charge or with an affordable cost.

The same system applies to the periodicals as well. A printed copy of any article of any journal can be ordered from the world libraries through a payment-per-page system. You usually get your printed copy within two weeks.

- **Be aware of copyright issues.**
  We shall respect the intellectual properties. Photocopying an entire book or extensive journal paper copying is against to the "protection of intellectual property system (copyrights)".

Order a copy of the original book through the Bookstore, or online bookstores like Amazon.com if a book seems to be a must item in your private collection.

**Developing search and reading strategies.**

A library visit may be inefficient, hence it may turn out to be a waste of time, or result with confusion if you don't have a search plan or reading strategy. Here are some tips:

- **Develop a source list.**
  In order to save time, develop a list of possible sources first and then go to look for all of them at once. After you have identified at least fifteen call numbers, begin looking for them. You can expect that more than half of them will either not be on the shelves or be inappropriate.
Look on the shelves in the vicinity. You may find other helpful books that you didn’t notice in the online or card catalog.

- **Make a separate so-called "bibliography card" for each item in the source list.**

In order to develop a flexible source list, make a bibliography card for each credible source that you find. In this way, if the source proves to be useless, this can be indicated on the card. This may save you another trip to the stacks if the citation appears again and you have forgotten that you have already looked at that source.

It is usually best to arrange the cards in alphabetical order by the last name of the first-listed author. At the end of your literature search, you will have a stack of cards that you can rearrange however you like for your bibliography or list of references.

7.7 cm x 12.5 cm cards are commonly used for bibliography cards. These make it easy to record the necessary information. A typical bibliography card should contain all essential bibliographic information as well as the call number, which will enable you to find the publication if you need it again.

The bibliography card should contain more than just the citation information. Use one side of the card for this information, but use the other side of the card to record additional information about the content of the source. Keywords or short phrases about the content of the source can prove to be very helpful at a later date.

Here is an example for a typical bibliography card.

![Front page of the card.](image1)

![Back of the card.](image2)

Please note once again that full bibliographic information should be recorded on the card in order to save your time in preparation of "list of references" section of your thesis. Otherwise you always have the risk of digging the library once again to find out the complete bibliographic information at the thesis writing stage.
Please also note that you can develop electronic bibliography card systems on MS Excel or other advanced computer systems. Using EndNote for this purpose brings unimaginable benefits. We will learn how to use EndNote later.

- **Develop a systematic archiving (filing) system for your printed material.**
  Copies of journal articles, encyclopedia items, standards, short book sections etc should be archived carefully in big folders in an order of the last name of the first author.

- **Save the electronic copies systematically**
  Files of full-text journal articles, review articles, hand-books, and e-books should be saved on separate folders in your "My Documents".
  Following systematic and practical file naming system is suggested: Last name of the first author, short title of the article, publication year. Avoid using the original file names which are usually meaningless numbers and text like "untitled.pdf".

- **Do not read everything if you don't have to.**
  A word-by-word reading of a source is often unnecessary. Start with the abstract or summary, or table of contents section, then jump to the conclusions section. In majority of the cases this will be sufficient to guide you about relevance of the body of the article to your concerns.
  You can easily jump and focus on some certain sections of the source after a quick eye-scan. For example, if you are interested on a method you can jump to the "Experimental" section of the article. Your instincts will guide you about reading which part next.

- **Highlight or take notes while you read.**
  Highlight the specific information (which is likely to be used in your thesis) on each article, or put notes to the margins while you read.
  You can do the same thing on the electronic pdf files with Adobe Reader 8.0 or later. Go ahead and learn how to do it, and do some practice.
  Avoid exaggeration on highlighting. Do not highlight the lines you understood! but highlight the ones you likely need while writing your thesis.

- **Avoid unnecessary branching or zapping while you read a source.**
  Inexperienced readers may be trapped by stopping reading a source and zap to another book or article listed in the references section of that source. That destroys your concentration and efficiency.
  Instead, record the bibliographic information of that reference on a separate bibliography card for future examination, and continue reading.
  Human curiosity may end up with a big list of articles to be read. Reading or examining all of them may physically be impossible due to time considerations. Several of them may be irrelevant to your main concerns. Therefore, define your limits for what to read. Get help from your supervisor if you feel you are in in trouble.

### How to search for all the books published in your field?

Web pages of Amazon.com or other on-line books may be sufficient for obtaining a list of all the books published in your field but they will never be complete since they only include the books they sell in their databases.

Some institutions or companies keep a record of all published books world-wide and allow a systematic search. Some are amazingly supply expert book reviews as well.

Bowker's "Global Books in Print" is one of such services. It has an amazing database of all in-print, out-of-print, and even forthcoming books, audios and videos with optional videos.
“Book Index with Reviews” of EBSCO Information Services Group is offering a similar search service for books. This index have a comprehensive database that provides information on over 4 million book titles in a wide range of formats, including large print, books on tape, etc. Fiction and non-fiction titles are included in the database, in all genres.

There are similar databases available in different names on the web.

You can get access to these services from the WEB page of EMU Library. Just follow the following instructions for a trial search in Global Books in Print. Accessing and usage of the Book Index with Previews is very similar.

- Open the web page of EMU.
- Click "Library", and click "Online Bibliographic Databases" on the opened window.
- Click the link for Bowker's "Global Books in Print" in the opened window. Your search page is ready.
- Input the keywords into the "keyword" text field and click enter.

You can also modify your search by clicking or choosing appropriate parameters like the keyword type (as author, ISBN/UPC, or word in the title, or exact title), status (as in print, out of print, or forthcoming), format (as book, audio or video), markets (country or territory available).
You can also force the browser to sort the search results by "author", "title", or "publisher" or more by clicking choices below the "Brows by Index" title; or just trust to the system by clicking "SUBMIT" button (or clicking "Enter" on the keyboard).

Your search results are ready:

You can get detailed information on each item listed by clicking the title of the book, or select and save the item for future review or listing, or printing. Several other easy-to-use facilities are available.

**How to search for all research articles on your research topic? What are citation indices or databases?**

Similar to the case for books, some institutions provide continuously updated searchable databases of all research articles published worldwide. These databases are marketed in different names and in different formats and content. Some have databases in a very broad range of fields whereas some are limited to a certain field.

Some examples of such "indexing" services are "ISI Web of Science" of Thomson Reuters, "Electronic Journals Service" of EBSCO, Compendex of Engineering Village, MathSciNet of American Mathematical Society, Chemical Abstracts of American Chemical Society etc.

No need to mention that the use of such services require subscription. Individual memberships are extremely expensive. They usually serve their users via institutional subscriptions. EMU also has subscription to the databases mentioned above through ANKOS Consortium, and all MU members including students can use them free of charge.

*What is an index or a database?*

An index or database is merely a searchable table composed of rows and columns in information technology jargon.

A row (also known as a "record") is added for each article published. whereas each column (also called a field) contain a different bibliographic data under different field names like "Article Title", "1st Author", "2nd author", "Journal published", "Publisher", "Volume number", "Issue number", "Page number", "Language", "Abstract", "Keywords" etc. Thus "indexing databases" contain millions of records for all articles published so far.

These databases can be searched for retrieving the most relevant records (articles) by the use of specially designed user friendly programs that can be used through internet. These programs are called "search engines" in internet jargon. Google is the most common search engine. However, Google is not restricted to scientific search. Usually each indexing service has its own search engine.

Doing search in these databases can be as easy as using Google, or slightly complicated for fine tuned (advanced) searches.
**What is a citation index?**

A citation index is a database of all published articles (as mentioned above) together with cited references in a record. This means that citation indices does not only contain the bibliographic information for each article, but also gives the "list of references" of that article.

This is a very useful utility since you can directly jump to the cited reference, or, the indexing service can provide the number of citations a given article received so far.

Citation indices may also have the links to the full-text version of an article and times cited by other publications.

**What is “Science Citation Index - Expanded”, Arts & Humanities Citation Index” and "Social Sciences Citation Index”? What is "Web of Science"?**

These are the databases citation index databases developed by ISI of Thomson Reuters Company. Thomson Reuters market these three products under the name "ISI Web of Science". In other words, ISI Web of Science is a common platform for accessing and searching these three databases. These databases are the most comprehensive databases most commonly used by the researchers all over the world. Web of Science does not only provide the list of publications (mostly journal articles) with their complete bibliographic information, abstracts, and links to the full-text articles, but also serves as a quality indicator for their member journals.

In other words, every published journal is not indexed in Web of Science, i.e., They are filtered out of the system by using certain measures of quality. Hence, inclusion of articles of a journal in the databases of Web of Science is an evidence of scientific reliability and trustability of that journal. We will discuss the reliability of the journals elsewhere.

As the names "Science Citation Index - Expanded (SCI-E)", Arts & Humanities Citation Index (AHCI)” and "Social Sciences Citation Index (SSCI)” imply, each database in Web of Science includes records from leading journals in three general fields: Science, arts and humanities and social sciences, respectively.

Here is a quick summary of these databases in numbers:

<table>
<thead>
<tr>
<th>SCI-E</th>
<th>SSCI</th>
<th>AHCI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of journals and disciplines covered (as of October 28th, 2008)</td>
<td>7756 journals across 150 scientific disciplines</td>
<td>2395 journals across 50 social sciences disciplines</td>
</tr>
<tr>
<td>Average number of new records added every week</td>
<td>19000</td>
<td>2900</td>
</tr>
<tr>
<td>Years covered</td>
<td>1900 to present</td>
<td>1956 to present</td>
</tr>
<tr>
<td>Links to full text articles</td>
<td>70% (as of January 1991)</td>
<td>60% (as of January 1992)</td>
</tr>
</tbody>
</table>

**What is Science Citation Index? What is the difference between "Science Citation Index" and "Science Citation Index - Expanded"?**

The difference is merely on the quality of journals covered. Science Citation Index (SCI) covers top quality journals (3754 journals as of October 28th, 2008). Coverage criteria and procedure for the journals indexed in the SCI is more rigorous. For example, the rejection rate of manuscripts sent for publication by authors is much higher, and the articles published are reviewed by more eminent researchers. SCI-E covers the journals indexed by SCI but it also covers about 4000 additional journals which are also of fairly acceptable quality.
Science citation index cannot be searched individually on the web. It is a printed product, i.e., conventional printing, or printing on CD’s. But you can see the list of journals covered by SCI by using the “Master Journal List” of Thomson Reuters-Scientific. We will see how to use this list also for different purposes elsewhere in this lecture.

**How to use ISI Web of Science?**

ISI Web of Science provides a very user-friendly search window.

All EMU members (staff and students) can automatically log in (access) to ISI Web of Science from all computers connected to the EMU network. They can login from their home as well if they connect to the internet through EMU servers.

In this section a quick introduction on the use of ISI Web of Science will be done. Illustrated guides for efficient and effective use of ISI Web of Science are available in the main page. Please refer to these guides before or while doing your literature search.

*Accessing the Web of Science “General Search” Window and fixing the initial limits and settings*

To get access to ISI Web of Science follow the following instructions:

- Click "Library" on the EMU main page: [www.emu.edu.tr](http://www.emu.edu.tr)
- Click "Online bibliographic databases"
- Click "ISI Web of Science"

The page opened is the "General Search" window on which you define set / define / enter your search terms and criteria.

Note: The layouts of EMU web pages had changed recently. Hence, the above illustration shows the old layout, but instructions still apply.

- Click "Change limits and settings" to change (personalize) the time span and the databases.

- Check the database(s) you want to scan for your search terms (keywords). You can choose any one, any two or all of the following subscribed databases:
  - Science Citation Index - Expanded (SCI-E),
Literature search and reviewing with an emphasis on on-line search methods

- Social Science Citation Index (SSCI) and
- Arts & Humanities Citation Index (AHCI).

A single database may provide fairly enough coverage for your target publications. For example selection of only Science Citation Index - Expanded (SCI-E) is sufficient for literature search in physical and natural sciences or engineering fields. However, there is no harm that you choose all subscribed databases. This will only affect the response time.

The lower limit for time-span settings is limited to your subscription (1980 for EMU). Here are the possible time span options as defined by ISI Web of Science:

**All years** – Searches all years of all databases in your current subscription.

**Latest 5 years** – Searches the current year and the last four years that we entered records in the product database (e.g., 2003 to 2006 plus 2007).

**Year to date** – Searches the current year (e.g., January 2007 to June 2007).

**Latest 4 weeks** – Searches the last four weeks of data that we entered in the product database.

**Latest 2 weeks** – Searches the last two weeks of data that we entered in the product database.

**Latest (current) week** – Searches the most recent week of data that we entered in the product database.

**From** – Searches a range of database years (e.g., From 2000 to 2007).

Choosing the "All years" option will be a wise choice if you don't do a search for a specific time interval.

You are now ready to do your first search in Web of Science.

**Doing a quick search on ISI Web of Science**

Illustrated guides/tutorials at beginner and advanced level use of ISI Web of Science is available on the main page of this course. Please go ahead and reserve some time for doing some practice guided by these tutorials. This will help you develop necessary skills for a literature search which is a must in being a good researcher. Here we will more talk about the merits of this tool and do quick introductions about the use of these merits.

Here is how you can do a quick "general search" in ISI Web of Science:

- Open the ISI Web of Science page and do the optional adjustments as shown above.

- All search pages do search with some supplied criteria (like time-span, type of database etc) and keywords. Now let's input "chitin OR chitosan" as our keywords in the first text field with a title "Search for...." and press enter (or click "Search" button).
After waiting for a reasonable time, your results page will be opened.

Top portion of the Results page look like:

And the bottom portion looks like:

Please note that you see several information on the opened page and several links or buttons for very useful utilities. These include:

- Number of records (hits) fulfilling your criteria and keywords (on upper left corner),
- A list of all records (article) hit with brief information. You can increase or decrease the number of records on each page.
- A link to open the details (full record) of each link.
- A link to the full-text electronic copy of each record, if available.
- A check-box for each record for marking the records you are interested in (for further collective revision, saving, printing or sharing),
- A side-bar having options for refining your search results,
- Buttons for saving, printing the results, or sending them to your own archive in EndNote (we will see later).
- And more...

Now let's see how to open the full record for each record (article). The full record shows the abstract, keywords, author affiliations and addresses, publisher info and links to other useful info like references cited and times cited, and impact factor of the journal etc.

- Click the title of any article listed on the results page.
In addition to full bibliographic information on the clicked record, you can find several useful information, links, buttons, and fine tuning check-boxes in the full-record page including:

- Abstract (summary) of the article.
- Author or system defined keywords,
- Addresses, or e-mails of authors,
- Links to other works of authors,
- Links to the references cited in the article,
- Links to related (similar) records,
- number of citations received by this article from other works,
- other useful information like the impact factor (a quality indicator which will be introduced elsewhere in this lecture) of the article’s journal etc.,
- Buttons for saving, printing, e-mailing, sending to your private collection in EndNote, selection for further reviewing (adding to Marked list).
- Button for accessing the full-text version.
- Checkboxes for adjusting the content of the output record etc.,

**Search Rules for keyword development in ISI Web of Science.**

Searching on ISI Web of Science is carried out through the use of keywords and other search criteria like time-span. It is easy but not as easy as using Google. One must develop a key-word set before starting a search.

A keyword set (also called “search terms”) is obtained by combining the keywords with AND, OR, SAME and NOT, called logical (or Boolean) operators. The computer looks for absence or presence of these keywords in the relevant fields of the records in the database and tabulates the ones fullfilling the criteria.

Here are some examples to the use of keyword combinations by using the logical operators. The numbers shown in parenthesis show the number of hits corresponding to the given search terms:

<table>
<thead>
<tr>
<th>Keyword Combination</th>
<th>Number of Hits</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;chitin&quot; only</td>
<td>8479 records</td>
</tr>
<tr>
<td>chitosan only</td>
<td>12617 records</td>
</tr>
</tbody>
</table>
Literature search and reviewing with an emphasis on on-line search methods

<table>
<thead>
<tr>
<th>Logical Operator</th>
<th>Number of Records</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>chitin OR chitosan</td>
<td>17046 records</td>
<td>Computer tabulates all records containing any of the words “chitin” or “chitosan”. The number of records found in the example is almost the sum of the records found for chitin and chitosan separately. (Why not the exact sum? Because some records may contain both chitin and chitosan.)</td>
</tr>
<tr>
<td>chitin AND chitosan</td>
<td>2391 records</td>
<td>Computer shows a record if both words chitin and chitosan coexist in the record. Note that the number of records found with the use of AND (i.e., 2391) is much smaller than the records found for the records found for chitin (8060) and chitosan (11377) when searched separately.</td>
</tr>
<tr>
<td>chitin SAME chitosan</td>
<td>965 records</td>
<td>Use of SAME is the same as the use of AND. The difference is that the computer selects a record if both words coexist in the same statement (or sentence) of the record. Note that the number of records in our example (965) is less than the number for “chitin AND chitosan” (2391) since the ones having these two words on different sentences had been eliminated by the use of SAME.</td>
</tr>
<tr>
<td>chitin NOT chitosan</td>
<td>5905 records</td>
<td>NOT is used to eliminate some words co-existing with other terms. In our example, the computer selects the records having the word “chitin but not containing “chitosan” Note that the number of records (5905) is less than the number for &quot;chitin&quot; only since the ones containing &quot;chitosan&quot; in addition to chitin had been eliminated.</td>
</tr>
</tbody>
</table>

Let’s see if the following sample record is included or excluded from the search results list upon the use of different logical operators:

![Sample Record](image-url)
Literature search and reviewing with an emphasis on on-line search methods

As you see, OR broadens the scope of your search whereas AND narrows it.
SAME is similar to AND but results with further narrowing. It is used to hit to more relevant records but brings the risk of missing fairly relevant records.

Here are the rules that must be considered for better search strategies, i.e., for tailoring your keywords.

• Capitalization.
You can enter lower case, upper case, sentence case, title case or mixed case search terms (keywords) and logical search operators.
Although the capitalization does not matter, developing a consistent capitalization habit is strongly advised. I personally use lower case for the keywords and upper case for the logical search operators like:

*chitin OR chitosan*

*energy AND matter*

• Search order precedence
If more than one logical operator is used to combine the keywords, the computer will process them in the background with a predefined order (precedence). Assume you add a third word to your keyword set: "biocompatibility". If you structure your search terms as follows the computer will find all records containing all three words:

Here is the search order precedence for all operators:
SAME > NOT > AND > OR

Thus, if you have a set of keywords like "chitin OR chitosan AND biocompatibility" the computer will first find the records containing "chitosan AND biocompatibility", then it will find records containing "chitin", then combine the results.

• The use of parentheses to modify or clarify the search order precedence.
You can change the search order precedence by using parantheses.
For example, you can write the same keywords as follows to search all articles on biocompatible chitin or biocompatible chitosan:

*(chitin OR chitosan) AND biocompatible*

With this, the computer will process "chitin OR chitosan" segment first, and then involve "biocompatible" in the search.

The use of parentheses is extremely useful especially if several keywords and several operators are used at the same time as exemplified below:

*(chitin OR chitosan) AND biocompatibility* SAME (blood OR cell)

*((nuclear OR radioactive) NOT (x-rays OR xrays OR rontgen OR reuntgen)) SAME (Uranium OR U238 OR U235)*

Please also note that the computer puts its parentheses in the background even if you don’t parenthesize your terms according to the rules of search order precedence.
Thus the search terms "chitin OR chitosan AND biocompatibility" are first parenthesized as "chitin OR (chitosan AND biocompatibility)" then processed by the computer in the background.

Please study the related section of "How to use ISI Web of Science?" for more detail on the use of parentheses.

- **The use of wildcards to hit all variations of a keyword**

  Some special symbols are used to find not only the keywords "as written" but also their variations or derivatives. This brings helps us to avoid missing several related records. These symbols are called "wild cards" in ISI Web of Science.

  There are 3 wildcards:

  **Asterisk ( * )**

  It is used to represent any group of characters including no character.

  For example, the keyword chit* represents all words starting with "chit" like chitin, chitosan, chitanase etc and equivalent to "chitin OR chitosan OR chitonase".

  **Question mark ( ? )**

  It is used to represent any single character.

  For example, "polymeri?ation" represents both polymerization and polymerisation and equivalent to "polymerization OR polymerisation".

  **Dollar sign ( $ )**

  It is used to represent a single character or no character and used especially for searching expressions.

  For example, "gamma$rays" represents all "gamma-rays", "gammarays", or "gamma rays".

  Thus, instead of trying to write all possible versions/derivatives of the keywords (there will always be missing possibilities!), just use the wildcards as much as possible in your search.

  Here are some other examples:

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Which is equivalent to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>polym*</td>
<td>(polymer OR polymerization OR polymerisation OR polymeric OR polymerizations OR polymerisations OR ...........)</td>
</tr>
<tr>
<td>s*food</td>
<td>(seafood OR soyfood)</td>
</tr>
<tr>
<td>colSr</td>
<td>(color OR colour)</td>
</tr>
<tr>
<td>ha<em>man</em></td>
<td>hofman OR hoffman OR hofmann OR hoffmann</td>
</tr>
<tr>
<td>techni*</td>
<td>Technique OR technic OR technical OR technics</td>
</tr>
<tr>
<td>organi?tion*</td>
<td>Organization OR organisation OR organizational OR organisational OR organize OR organise OR ......</td>
</tr>
</tbody>
</table>

Please study the related section of "How to use ISI Web of Science?" for more detail on the use of wildcards.

- **Searching for exact phrases.**

  Use quotation marks to search for exact phrases. Here is an example on doing search with the exact phrases "global warming", "united nations" and "european union":

  "global warming" AND ("united nations" OR "european union") AND turkey
Avoiding the use if wildcards is strongly advised.

- **Searching for the hyphenated words.**
  You can use hyphen separated words. For example the computer will treat *left-handed* as "left-handed" OR "left handed".

- **Avoiding the use of very common words (stop words).**
  The use of some very common words like *about or are or above or onto* etc are called stop words and treated as nothing (or a space holder) by the computer during the topic phrase search.
  You can see the whole list of stop words in the page: [http://images.isiknowledge.com/help/WOS/ht_stopwd.html](http://images.isiknowledge.com/help/WOS/ht_stopwd.html)
  Please study the related section of *How to use ISI Web of Science?* for more detail on the use of common words.

**Search types in ISI Web of Science**

You have to choose a search method before inputting the keywords.

ISI Web of Science has the following search options:

- **Topic Search.**
  Articles including your keywords in their title, abstract, and additional keywords are listed in the results page. This is the most common search method, and eliminates missing any related record. It's disadvantage is that the number of records listed is high and relevance of some records may be low.
  All search rules outlined above apply for topic search.

- **Title Search.**
  Articles including your keywords in their titles only are listed. The advantage of this method is its higher relevance to your search topic. It is a sort of "direct to the point" search. But there is always a risk of missing several reasonably relevant articles having your keywords not in the title but in their abstracts, or additional keywords. Therefore, this method should not be used if you aim a comprehensive search.
  All search rules apply to title search as well.

- **Author Search.**
  This is used to see the works of an individual researcher or a group of researchers in your field.
You just need the last name of the author. To refine your search you may then add only the initials of
the other names (first name, middle name if any, etc.).

Here are some valid search terms:

- **einstein a** (not Albert Einstein, or Einstein Albert)
- **akbulut a AND toppare l** (this will find all articles in which Ural Akbulut and Levent
  Toppare are coauthors)
- **wilson r** (use * if you are not sure if the author has other names)
- **yilmaz** (that is fine but that will result with 6477 articles - as of October 31st, 2008) and all
can not belong to the same author)
- **bens?n** (finds both Benson and Bensen)
- **hof$man$** (finds Hofman, Hofmann, Hoffman, or Hoffmann)

**Group Author Search.**

Instead of writing the names of individual researchers some institutions use registered "group author"
names. For example IBM uses "IBM IQ ENGINE TEAM" for their articles produced by this team.

You can get the exact names by clicking the search aid button adjacent to the search type selection field.

**Publication Name Search.**

Use this to find articles published in a given journal.

Enter the full name of the journal or use asterisk after some initial portion of the name.

The safest way to input the full journal name is to copy and paste it from the list of journals that can be
accessed by clicking the search aid button adjacent to the search type selection field. Just copy and paste the full
name from the opened window.

You can only use asterisk (*) for truncating the names. For example

- **journal of polymer science**

will retrieve the articles from 5 different journals:

- JOURNAL OF POLYMER SCIENCE PART A POLYMER CHEMISTRY
- JOURNAL OF POLYMER SCIENCE PART B POLYMER PHYSICS
- JOURNAL OF POLYMER SCIENCE PART C POLYMER LETTERS
- JOURNAL OF POLYMER SCIENCE PART C POLYMER SYMPOSIUM
- JOURNAL OF POLYMER SCIENCE POLYMER SYMPOSIA

Use of asterisk in the middle is not allowed. For example "journal of* studies" will yield no results.

**Publication Year Search.**

You can limit your search to certain years. This is usually used in combination with other search types
as shown below:
Following are valid examples:

2007
2001-2007
2006
(2001 - 2006) NOT 2004

OR

Note that one can not use the operator AND or SAME looses their meaning in a publication year search since an article can not be published in two different years.

Also note that the use of wildcards are prohibited for "publication year search". Thus "200*" will result with an error.

Finally, do not forget that only a maximum 10 year range can be included.

• **Address Search.**

You can search for articles published by the researchers of an institution, or a city, or a country by and address search. This search requires the use of some abbreviations for certain words like "univ" for "university". Scan the "abbreviations list supplied when clicking the "view abbreviations list" link before typing your keywords.

Followings are valid keywords:

middle e technical univ OR orta dogu teknik universitesi OR metu or odtu

(Note that e is in the abbreviations list and stands for east))

(eastern mediterranean univ or dogu akdeniz universitesi OR emu or dau) AND cyprus

(Note that "AND cyprus" secures the exclusion of the records belonging to E)

ankara NOT gazi univ

(This will list all the records originating from all universities in Ankara by excluding the ones from Gazi University.)

n cyprus OR TRNC

• **Mixed Search.**

One can do a mixed search including more than one search type. For example, one can do a search for all articles on "polymers" published by researchers of University of Akron (USA) in "Journal of Polymer Science" between 2000 and 2005 as shown below:
Note that you need to specify the search type for each field as topic, or address etc., from the drop down list adjacent to the text box (field) for keywords.

Search window opens with 3 fields for this purpose. For additional search types you can open a new field by clicking "Add Another Field" (as done in above example).

**Printing, saving and e-mailing the search results.**

One can easily print, save or e-mail the results of a search (general or cited reference search) easily.

You need to fix the output record options to desired details before taking an output action as exemplified below.

Choosing "Save to HTML" is strongly recommended since it will also save the links plus it can be easily converted to MS Word document whenever needed.

Please study the related section of "[How to use ISI Web of Science?](#)" for more detail on the use of output actions.
**Marked List: Marking (selecting) the most relevant records for future review and processing.**

Assume you did a search and ended up with a results page containing 245 records. All these 245 records may not be relevant to your search interest. In such cases you do a quick examination of the listed articles and eliminate the obviously irrelevant ones, and save the remainings for later deep review or processing like printing, saving, e-mailing etc after completion of your search sessions.

A utility called "Marked List" is used for this purpose.

You can select the records of interest by clicking the check-boxes adjacent to these records, and add to marked list by clicking the corresponding command button as shown below.

You can specify a range of records by their pages, or number of records as well by using the option fields at the bottom of every results page rather than selecting them one-by-one.

You can open a Marked List by clicking the menu item "Marked List".

A results page containing only the marked records will be opened. You can do whatever you can in the regular results page.

Please study the related section of "How to use ISI Web of Science?" for more detailed use of Marked List.

**Search History:**

ISI Web of Science records each search as a set in a search session in the background. That means that the search terms (keyword combinations) and criteria is saved as sets of searches.

You can get access to your search history any time by clicking the "Search History" menu item as shown below.
Literature search and reviewing with an emphasis on online search methods

Your can combine sets, or open sets to explore freshly added articles by using the saved search terms and criteria, you can ask the system to send you periodic e-mail alerts about recently published articles fulfilling your criteria etc. by using the following “Search History” window.

Please study the related section of "How to use ISI Web of Science?" for more detailed use of Search History utility.

**What is Cited References Search and how to do it?**

Cited reference search is used to find how many times an article was cited by other articles. In other words, it is used to measure the interest of other researchers to one’s research outcomes in the scientific arena. The number of citations received by the works of a researcher is used as a quality indicator in academic/professional promotions. Institutions ask for the total number of citations received till the day of application for promotion.

ISI Web of Science already shows the number of citations received by an article in the results page as shown below, or in the full record page. You can see all citing works for this work by clicking the number for times cited.

But ISI Web of Science offers a more useful service specially designed for cited reference search. You can get access to this page from ISI Web of Science's General Search Window as shown in the following illustration:
Please study the "What is Cited Reference Search and how to do it in ISI Web of Science?" as an illustrated guide for the use of Cited Reference Search utility.

Using "EndNote" as a very handy tool for automated archiving, organizing, sharing, citing and formatting your reference collection.

You may need to archive (save) the records of some important articles for various reasons. Here are some of them:

- to form a collection of your references to be used in thesis or journal article manuscript preparation
- share them with your supervisor or team members
- online access to the full-text version of the article anytime in future
- quick copying and pasting your own publications to documents like your CV
- prepare error-free automated reference list preparation for thesis or article manuscripts, etc.

You can do this very easily and effectively by using a software called EndNote Web of ISI Web of Science. The web version (Endnote Web) is free for all subscribed users of ISI Web of Science. This software can be bought and downloaded for increased efficiency.

The details of the capabilities and use of EndNote is illustrated in the guide "What is EndNote, and how to use it?". This guide also shows how to integrate EndNote with MS Word for automation of reference insertion and reference list preparation during a research article manuscript preparation, or thesis writing.

The following illustration just shows how to add selected records to EndNote in ISI Web of Science.
ISI Master Journal List (MJL) Search.

ISI Mater Journal List is a list of all journals covered in all databases of ISI (i.e., SCI, SCI-E, SSCI, A&HCI etc).

It is used for various purposes like:

- finding out if a journal is covered by a specific database like SCI.
- selecting high quality journals for reading.
- selecting a high quality journal for publication of your research article manuscript.
- exploring the journals covered by a specific database like SCI-E.
- checking if a journal satisfies the promotion criteria of your institution etc.

One can get access to MJL by clicking the following link: [http://scientific.thomson.com/mjl/](http://scientific.thomson.com/mjl/)

You can also get access to this page from the home page of Thomson Reuters if the above link is eventually broken.

Please study the illustrated guide "How to do a search in ISI Master Journal List?" for learning the detailed use of MJL.

**Journal selection criteria for reading and for publication.**

One may easily conclude from the above discussions that one needs to be selective in what to read. One may also conclude that coverage by SCI or ISI Web of Science databases is a good indication about the scientific reliability (i.e., quality) of a journal. In this section we will try to understand what we mean by scientific reliability, or quality by listing the measures associated with scientific reliability.

The following criteria can also be used for finding a high quality journal for publishing research article manuscripts as well.

Here are some of these criteria / factors / parameters to be considered in journal selection.

- **Profile of a journal**

  Some journals publish only theoretical studies whereas others may emphasize on applications.

  Most journals publish mainly full journal articles. They may also publish review articles. Some may be devoted to only review articles or conference proceedings.

  So you have to read the profile of a journal carefully. The "profile" of a journal is found in the web page of the journal.

Here is an example:

**CARBOHYDRATE POLYMERS**

* A Journal Devoted to Scientific and Technological Aspects of Industrially Relevant Polysaccharides

**Editors:**

J.F. Kennedy, J.R. Mitchell, G.M. Glenn

See [editorial board](http://editorial-board.com) for all editors information.

**Description**

Carbohydrate Polymers covers the study and exploitation of carbohydrate polymers which have current or potential industrial application in areas such as food, textiles, paper, wood, adhesives, biodegradables, bioflocking, pharmaceuticals, and oil recovery.

Topics include:

- studies of structure and properties
- biological and industrial development
- analytical methods
- chemical and microbiological modifications
- interactions with other materials

The journal publishes review papers, original research papers, short communications, and book reviews. Only papers with international relevance are published.

The most common type of publication is “full journal article” which can be published in vast majority of journals. Here are examples to other publication types:

- letter to the editor
- note to the editor
- review article
- book review
- reprint
- software review
- conference proceeding
- etc.,

(See a full list of possibilities on ISI Web of Science General Search page by clicking the “Document type” in the related drop-down list as shown in the following snapshot:

If you are planning to publish, make sure that the journal you are planning to send the work publishes documents of the type of your manuscript. This is usually indicated in the “Instructions to the authors” section of a given journal.

Some journals publish only reviews. These journals usually have titles starting with “Advances in...”, or “Progress in.” or have the word “reviews” or similar distinguishing words.

- Peer-reviewing (Refereed journals) and Indexing

Make sure that you read or send manuscript for publication in a journal which is peer-reviewed by international experts of the field. You can assure this by selecting a journal from ISI Science Citation Index, or at least Science Citation Index – Expanded. ISI, in its journal selection process, chooses journals having highly trustable peer review system. You can check the coverage of Science Citation Index or other citation indices by using the Master List Search utility of Thomson Reuters as shown in the "ISI Master List Search" guidelines of this course.

Some journals have only editorial review. These journals do not send the manuscript to expert referees for peer review, but they decide for publication by a quick overview of a group of editors from a broad array of fields. A journal with such a reviewing system should be avoided.

- History, readability and reputation of a journal

Make sure that you read or send your manuscript to a well known journal having a satisfactory history. A good hint for the age of a journal is its volume number in its latest issue. For example, the latest volume number of the highly respected journal “POLYMER” is 49; meaning that it is being published by 49 years.

Academicians usually receive e-mails from the publishers of new journals inviting them to send their manuscripts to them. One should read these mails cautiously since they promise (indirectly) easy
publication. Do not jeopardize your work by submitting it to such journals. This may result with an irreversible harm in your prospective academic life.

You can learn the latest volume number of a journal by writing or copy/pasting the full name of the journal to the keyword field and choosing the “Publication name” option from the drop-down list in the ISI Web of Science General Search page as seen below. Look at the volume number of the first record on the results page.

Some universities or institutions publish their own scientific journals. There is a common negative impression of these “university” journals that they usually publish articles that can not be published elsewhere. This is not an all-inclusive judgment, of course, but alerting enough to avoid such journals in reading or publication.

The publication company itself may assure the quality of a new journal. For example, all journals published by Elsevier, or Wiley, or Springer can presumably be accepted to be good or highly trustable. The new journals of these publication companies may easily be interpreted as “promising”. You may consult experienced researchers or academicians about the names of such respected publishing companies.

• Publication Lag.

Publication lag is the time period between the date of manuscript submission and the date of acceptance for publication. It is important for especially PhD students who must publish a paper before the thesis defense, or academicians awaiting for publication for an academic promotion as it is the case in Eastern Mediterranean University.

It may not be easy to learn the publication lag of a journal. But try your luck by either visiting the official page of the journal or do a search in Google.

Actually, the best tool is referring to the past experiences of people published an article in a given journal. Therefore ask people about their experiences. If you don’t have anybody in your vicinity, you can try your chance by asking the experiences of authors of the last issue of a given journal through e-mail.

To learn the e-mail of an author of an article see the “E-Mail Addresses” section of a record in the results page of a ISI Web of Science General Search session as exemplified below:
Publication lag may be long mainly due to two reasons.

**Publisher inherited publication lags:** Long publication lags are usually due to the long evaluation and processing system used by the publisher. Examples are slow editorial processes, long review periods, use of surface mail rather than on-line submission and processing etc. You have almost nothing to do to shorten such long publication lags. Just abandon the journals having inherently long publication lags.

**Author inherited publication lags:** Publication lags may elongate due to the mistakes of authors even in fast journals. These mistakes are usually due to the failures in manuscript preparation including;

- format of paper
- style of references
- language and spell-checking
- insufficient discussion (usually results with rejection of manuscript but it may result with “acceptance after correction” if you are lucky)
- poor quality art-work (graphs, illustrations, tables)
- undesired picture formats
- etc.

So one should prepare the manuscript package very carefully totally in parallel to the “Instructions to the Authors” section of the selected journal to lower the publication lag.

No need to mention that one should choose journals that accept on-line manuscript submission and on-line evaluation process. Famous publishers (e.g., Elsevier, Wiley etc.) have their on-line manuscript submission and evaluation systems. Usually there is a single internet platform providing on-line system for all journals published by a company. See the "Submitting" section of the "Research article writing and publication skills" chapter of this course for an illustrated guideline on online submission.

- **Impact factor**

Impact factor is an indication of average number of citations to articles published in a journal.
It is calculated for each journal each completed year by using the equation.

\[
\text{Impact factor} = \frac{\text{Number of citations received by the articles of the journal within the year considered}}{\text{Number of articles published in the previously completed two years}}
\]

For example, the impact factor for the journal "Carbohydrate Polymers" for 2006 is calculated as:

\[
\begin{align*}
\text{Citations in 2006 to articles published in 2005 is } & 303 \\
\text{Number of articles published in 2005 is } & 227 \\
\text{Citations in 2006 to articles published in 2004 is } & 464 \\
\text{Number of articles published in 2004 is } & 203 \\
\text{Total number of citations in 2006 to articles published in 2005 and 2004 are:} & 303 + 464 = 767 \\
\text{Total number of articles published in 2004 and 2005 are:} & 227 + 203 = 430 \\
\end{align*}
\]

\[
\text{Impact factor} = \frac{767}{430} = 1.784
\]

Impact factor is a quality indicator for a journal, but it may easily fail due to the following reasons:

- It does not exclude self citations,
- It may be very low in certain fields with very limited number of researchers (meaning very limited number of citations)
- It does not differentiate between the document types. For examples, review articles cite to and receive from various other articles. Therefore they have high impact factors.
- etc.,

Therefore judgments based only on "impact factors" are prone to failing; which, in turn, may result with very unfair consequences.

- **Immediacy index.**

  It is the “average number of times that an article published in a specific year within a specific journal is cited over the course of that same year.” For example, if there are z citations to articles published in Journal A in 1994, and Journal A publishes n articles in 1994, then the Immediacy Index for Journal A in 1994 is \( z / n \).

  Immediacy index intends to measure the first contact period of the readers of a journal. It should also be handled carefully as a quality indicator by itself.

  How to learn the latest impact factor and immediacy factor as well as other "measurable" citation parameters of a journal? By using the Journal Citation Reports of ISI:

- **Rejection rate.**

  It is the rate of the manuscripts rejected for publication. Rejection rate is a measure of the selectivity of a journal. This criteria is also a not an easily obtainable one.

- **Promotion or award requirements.**

  Academic promotion criteria of your institution may dictate the range of journals you must publish your work. For example EMU PhD candidates should publish at least one article published in a journal listed in SCI or two in SCI-Expanded.
The amount of publication awards of TUBITAK is also based on the category of the journal (Category A = 1200 YTL, Category B = 800 YTL, Category C = 400 YTL in physical sciences for 2007-2008 publications).

- **What is a "Tough" or "easy" journal?**
  
  Depending on all criteria listed so far you can send your manuscript to a "tough" or an "easy" journal. Each has its own advantages and disadvantages. In summary:
  
  A tough journal has
  
  - stringent peer review
  - possibility of rejection
  - a risk to destroy your motivation

  An "easy" journal has:
  
  - low rejection rate
  - easy acceptance
  - a lower capacity to reach appropriate readers
  - reduced impact for your results

  You may need to balance in between for publication purposes but choosing tough journals for "reading" is always recommended.

- **What is h-Index?**
  
  It intends to be a criteria about the research quality of a researcher (author). The h-index is "the number of articles, h, all of which had received at least h citations". For example a researcher is said to have an h-index of 11 if he received at least 11 citations to each of his 11 articles. The total number of publications of this researcher may be the same or more than the h-index. In other words having an h-index of 11 does not mean that that researcher has only 11 publications; he/she may have more of course, but only 11 of them received a minimum of 11 citations.

  Similar to the impact factor or immediacy factor, h-index is also dangerous to use as the only criteria to evaluate the quality of a researcher.

  Don't forget that Einstein has an h-index of 5, which is smaller than the author of this text (O Yılmaz, h-index= 6 as measured in April 2008). Einstein has only 5 publications, therefore h-index can not exceed 5 even though these publications received thousands of citations.

  One may have low h-index even though he has a big number of publications. Assume that a scholar has 96 publications. 3 of these publications receive say about 500 citations each (meaning that he is a star in his field) but other 93 articles get 0 citation. In hat case, his h-index is only "3".

  One other drawback of h-index is that it is age-dependent. Assume, as a PhD student you published a research article. Your h-index will never exceed 1 even though you receive 10 thousand citations for this article as long as you publish a second one.

  So h-index is insufficient to evaluate the researchers when used alone.

- **What is "Gray Literature"?**
  
  It is a term used by the research community to refer to the publications (like technical reports, working papers, white papers, reprints etc....) that can not be easily reached by normal scientific search engines. Google Scholar (no need to mention that Google itself) covers the gray literature. ISI Web of Science, and even Scopus (another web based indexing service) does not cover gray literature.

  We can easily conclude that Gray Literature may be more valuable for technicians, engineers etc but not for researchers who are after "new original research"

- **What is a "Preprint"?**
A preprint is a draft research article that has not been published yet in a scientific journal. Therefore, referencing to preprints should be avoided.

- **What is a "White Paper"?**

  A white paper is a guideline or a report to solve a specific problem in a specific field. They are usually used as the training material for the politicians or bosses. For example, experts may prepare a white paper on "global warming" to the new "Minister of Environment" of a country to supply the necessary background to him such that he can lead the people with healthy decisions.

  White papers are not original by nature, therefore they should be excluded from our references or reading list, if there is no absolute requirement regarding your work.

**Top of page**

**How to use the Journal Citation Reports?**

You can get several quality indicators like impact factors, immediacy indices of journals by using Journal Citation Reports utility of ISI. To get access to the Journal Citation Reports click the link:

http://admin-apps.isiknowledge.com/JCR/JCR?PointOfEntry=Home&SID=U1KFGa4M@H14EAhFKfH

However, getting access to this page is possible only through subscription.

You can search for a given journal or a group of journals from a selection subject categories and examine their journal citation reports on a results page as shown below.