Information Literacy 2 – Research Strategies for Seminar Papers and Theses

Lecture Notes
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1 Where do I search for literature on my topic?

Probably you are already familiar with various search interfaces that are suitable for literature research. Web search engines can be a great starting point for your research, especially academic search engines such as Google Scholar and Microsoft Academic Search. However, almost all web search engines come with the disadvantage that we do not know which sites and sources they actually search. In order to obtain reliable and quotable on-topic information and to make sure that you do not miss important publications, the services of a university library are essential.

1.1 Literature research in the University Library’s catalogue?

In the University Library’s catalogue, you will find primarily books and journals whether in printed or electronic versions. This online catalogue, called OPAC (http://www.ub.tum.de/en/opac), is always the starting point for your search.

As you will frequently need only parts of books or journals - single book chapters or journal articles - other interfaces are often preferable for searching literature on a specific topic, these are known as bibliographic databases.

The University Library at the TUM offers a multitude of bibliographic databases for subject specific search. So how do you find the right one for your subject?

1.2 eAccess

As a member of the Technical University Munich, you are allowed to use databases and other electronic media (ejournals and ebooks) outside the campus network, e.g. from home. Therefore, you have to log in via eAccess first. You will find eAccess on our website www.ub.tum.de/en in the grey box on the right side.
eAccess is only available in German. Please log in with your TUM ID.

If you now want to look for databases choose the Database Info System DBIS (Datenbank-Infosystem) on the following page.
1.3 Which bibliographic database is right for me?

Our system assists you in choosing the right database from our various licenced bibliographic databases. It provides you with an overview of the databases' contents and facilitates access to research interfaces. Please note, all information about these databases are only available in German.

You find the access to our databases on our website www.ub.tum.de/en. Use the menue on the left of this site and click on “Searching & Finding” => “Databases”: 
Click at the arrow at the end of the line “Fachübersicht” for an overview of our subjects and their databases.
Searching by subject (Fachübersicht)

After choosing a subject you will find its most important databases under the heading “Empfohlene Datenbanken” (recommended databases). All databases for this subject will be listed below the heading “Alle Datenbanken” (all databases).

By clicking on a database’s name, you will access additional important information about its content. This will help you to find the one that best suits your purposes.

- Does the database cover my subject? (The information about content and keywords may be helpful.)
- Is the outlined content relevant to what I am trying to find?
- Do I only want to search for journal articles for example?
- In many cases, you will find a link to the list of journals, which are contained for the database. Does this list include the journals, which are important for my subject/my work?
- Does the database include current literature or has its reporting period (Berichtszeitraum) already expired?

In the course of compiling a database, providers collect the content of academic publications such as journal articles, congress contributions, books, research reports, clinical studies, financial and statistical data, business reports etc., as well as sorting the information and assigning keywords or categories. Therefore, by using the database’s interface you can make your search for literature very precise.
Bibliographic databases list books, articles in collected editions, journal articles, and other sources of information, regardless of whether or not they are available from a specific institution (e.g. the TUM University Library). So, how do you find articles in a database and how do you obtain full texts?

1.4 How do I find journal articles on my subject?

1.4.1 What does a database look like?

The database Scopus is a good practice example for using a bibliographic database. Here are some key facts listed:

- **Type of database**: Article and citation database
- **Content**: More than 69 million abstracts and literature references
- **Fields of research**: All areas of natural sciences, medicine and engineering sciences, social and health sciences, arts and humanities
- **Reporting period**: 1788 -
- **Special features**: "Cited Reference Search": using this option you can analyze citations (prospectively and retrospectively) Peer-reviewed Daily update

You can access Scopus (and all other databases when you know their names) by searching for the name in the field “Suche” (search):
Searching in Scopus

If you want to use the services “Alerts” and “Lists” you have to register and initiate a personal account. When using alerts you will be informed by Scopus every time, when a new article which relates to your named subject is analyzed and collected. In the lists you can save hits for later use.

For searching literature you only need to use the search in “Documents”. A link behind each search field (add with the +) in the scroll down menu refers to an index where you can choose suitable search items:
In the following you find some examples how to phrase a query:

- The asterisk (*) is used for truncating a word (placeholder), it can replace any number of characters. You can cover multiple grammatical endings and different writings by using the asterisk at the end of a word (e.g. automat* → automatic, automat, automats, automatically…; cent* → center, centre, centers, centres …)
- Multiple search items within a field may be connected using AND, OR, NOT.
- If you want to search for authors’ names, you should enter only the the last name.
- If you search for terms which consist out of two words put these words in quotation marks (e.g. “heart attack”).
- The question mark stands for one letter in a word, e.g. you don’t know, if the word is written with an “c” or with an “s” (licen?e).
- The dollar sign ($) is used for one or no letter in a word, e.g. cancel$ed → cancelled and canceled.

**Citation analysis** – a special feature of Scopus and Web of Science (WOS), another database licenced at University Library.

In addition to the usual bibliographic data, you can find the following:

- Cited documents (= newer documents), number of documents that cite the article
- References (= older documents), number of documents cited in the article
- Related documents (= similar documents)
- Bibliometric or scientometric indicators: Source Normalized Impact per Paper (SNIP), Scimago Journal Rank (SJR)
1.4.2 What, if I still cannot find what I am looking for?

When searching for literature it is important to proceed systematically and to consider a few questions even before starting the actual search. A subject specific search can be divided into five steps.

1. Determining extent:
How extensively do you intend to search? Do you need only a few articles or do you have to review the relevant literature as comprehensively as possible? Do you need primarily basic reference works or highly specific research literature?

2. Choosing a research tool:
The research tools you should use differ depending on the extent of literature needed. In order to find basic works or specialised dictionaries, library catalogues are sufficient. If you need extensive collections of articles, however, you will have to search in subject bibliographies and/or article databases.

3. Analysing the subject:
Theses often have very extensive titles. What are the core aspects of your subject? To what criteria must your literature conform? Which subjects do the articles and books have to cover? Which terms must be included? Which single terms are thus suited for your search, what are the individual keywords of your subject?

4. Developing a search strategy grid:
You have determined the relevant keywords (step 3) for your subject which you will now insert in columns of their own.
The interfaces of some databases are in other languages, thus an initial step is to translate the keywords into the required language.
Possibly your field employs multiple terms to denote a single keyword. Because of this, you should find as many synonyms as possible – specialised dictionaries, thesauri and relevant literature can help you with this.
When entering terms into the bibliographic database search forms proceed as follows:

- Search for every single term in your columns separately using "all fields" in the database. Keep these results for a later stage.
- Revisit all your searches via the search history provided by most databases.
- Now connect the queries for all terms in the same column using OR, thus ensuring that at least one of these terms is contained in your result.
- After having created OR-connected result sets for all keywords in this manner, connect the keywords using AND, thus ensuring that all keywords of your subject are contained in the results.

5. Evaluating results:
Normally, the method presented above creates a manageable number of results, which you can subsequently examine for relevance. Nevertheless, the following problems may occur:

- **no or not enough results** – possible solutions:
  - control your input for typos/alternative spellings
  - try to find a better/alternative search term (using indices if necessary)
  - use more general search terms
  - leave out less important keywords
- select a different literature database for your search

- **too many results** – possible solutions:
  - use more specific search terms
  - generate additional keywords
  - confine the results set using formal criteria (e.g. show only articles of the last decade, restrict to review articles, restrict to a single language – but please be aware that you might lose important items this way)

2 How do I obtain the full texts of the articles I found?

2.1 SFX – Service, Fernleihe, eXtras (service, interlibrary loan and more)

Many databases provide you with a link or button to access the full electronic text: the SFX link ![SFX](https://example.com/sfx). It is also only available in German.

In some databases, this SFX button is shown in the result list, while in others you have to go to the details of the respective article. A new window or tab opens and lists acquisition options by clicking on SFX.
Use the red “Go” button at the end of each line to start the respective action:

- If the University Library offers the full electronic text, you will see it listed in the first line “Volltext verfügbar ...”.
- If this line is not visible, click on “Bestellung über dokumenTUM oder Fernleihe”. If the printed version is available at our library, you may order via dokumenTUM. If there is no access to the full text at our library, you can order via interlibrary loan. Please read 2.3 dokumenTUM and 2.4 Interlibrary Loan for more information.
- In the line “Kostenpflichtige Dokumentlieferung von Subito” (document delivery), you can order the article via the document delivery service subito - to arrive within 24 - 72 hours. (This entails costs of at least € 7.50).
- (Exception in the physics faculty: orders from employees using the document delivery service Getinfo (not in the SFX window) will be paid for by the faculty if they use the registered faculty account; see https://www2013.ph.tum.de/fakultaet/services/bibliothek)

2.2 What to do, if there is no SFX?

If there is no SFX button in a database or you only have a bibliographic list of articles, you will have the following options:
2.2.1 Searching for journals in the University Library’s online catalogue

You can find all print and electronic media available at TUM in the University Library’s online catalogue. If you want access with your own laptop or from outside the library, then you will need to log in via eAccess before you start your search (see 1.2).

**Attention:** Only *independent publications* are contained in the online catalogue, that is:
- Books – but no book chapters
- Journal titles – but no journal articles

Therefore, enter the **journal title** alone if you need a journal article.

- **Confine your search:** Additionally restrict your search for the article by choosing “Journal, Newspaper, Yearbook” as media type beneath the search request.
- If you are only interested in online journals, you can confine your search to online resources using the drill-down-menu on the left of the results list: choose Media Type “eJournal”.
- Search for the *journal’s ISSN* using the search field ISBN/ISSN. The ISSN is unique and leads directly to the right journal.
- If you know the exact title of the journal, search using the field “Exact Title”. It is also possible to use the field “Keyword in Title”. In this case, put the exact title in quotes. By using one of these methods, you can differentiate between journals with similar titles.

When you found what you were searching for, then there are two possibilities:

- The journal is available **in print only**:
  - view, copy or scan the article in the library or
  - order the article via the in-house article delivery service dokumenTUM: the scanned article will be emailed within 24 hours (weekdays) for free: [http://www.ub.tum.de/en/dokumentum](http://www.ub.tum.de/en/dokumentum)
- The journal is available **electronically**: a button [Read online](http://www.ub.tum.de/en/dokumentum) will be visible near the result in the online catalogue. Clicking it takes you directly to the Electronic Journal Library (Elektronische Zeitschriftenbibliothek, EZB) or the publisher’s page where you can access the full electronic text.

2.2.2 Searching for journals in the Electronic Journal Library – EZB

The library homepage ([http://www.ub.tum.de/en](http://www.ub.tum.de/en)) also provides access to the EZB:

- If you log in via eAccess in order to be able to access the licensed journals’ full texts from home as well choose EZB at the next page.
- Menu in the middle of the page => EZB
- Searching & Finding => E-Journals
The EZB lists all journals, which are published electronically (according to title, no individual articles) and manages access to the respective online version.

The availability of an electronic journal is indicated using traffic light symbols:

- **Green**: full texts are available for free
- **Yellow**: the University Library has a paid journal subscription – full text accessible for TUM members
- **Red**: the University Library has not subscribed to the journal – full text not accessible
- **Yellow-red**: University Library has subscribed for certain years.

Journal titles are arranged in alphabetic order or are sorted by subject. Additionally, quick and advanced searches are possible:

The results view of a journal title in the EZB contains the link to the full text, information about licensing, whether the journal is also available in a printed version and a link to the journal’s homepage.
2.3 dokumenTUM – The University Library’s in-house article delivery service

2.3.1 dokumenTUM for TUM students and staff members

TUM students and staff members can order scans of journal articles and scans of chapters of books, which are available at TUM in print only via dokumenTUM. This service is free of charge for TUM members. You will find the link to dokumenTUM in our OPAC.

First, search your desired journal or your book in the OPAC. You will see which years are available under “Local collection”: 
Now click on the tab “Get document”. Below you see the term “SFX”: dokumenTUM. Select the link on the right „follow link“.

Now you are returned to the same page of SFX as you already know from before. This page is only available in German. Choose the location of your branch library in „Bestellung über dokumenTUM oder Fernleihe“, mark „Ich bin für den dokumenTUM-Lieferdienst berechtigt“ (which means that you are allowed to use this delivery service free of costs) and click on “Go“.
Log in with your library number and password. Click on “dokumenTUM oder Fernleihe” and fill in the desired year or volume, if you want to order an article of a journal. Lastly, complete the data of your desired literature and order with the button below.

We will scan the article for you and send the PDF document via email. On request, or if the file is too large to send via email, we will procure the file on our library server. In this case, the URL will be emailed to you so that you can then view, print and download the document. Please note: The file will be deleted from the server after 10 days for copyright reasons. Documents will be delivered within two working days (no Saturdays, Sundays or public holidays).

2.3.2 dokumenTUM for external users

This service is fee-based for non-TUM members, who can access dokumenTUM and order on our website www.ub.tum.de/en/ >> Borrowing & Ordering >> Document Delivery & Interlibrary Loan >> dokumenTUM >> Terms of Use >> Who can benefit from dokumenTUM?
Please fill in the data of your desired literature in the webform and order https://www.ub.tum.de/en/dokumentum-external.

Due to licensing restrictions, electronic delivery is not available for external users. We will provide your ordered articles and book chapters as a paper copy at your requested branch library. You can pick them up upon payment of the service fee at the circulation desks.

### 2.4 Interlibrary Loan (ILL)

#### 2.4.1 What is interlibrary loan?

If the books or articles you are looking for are not available at the University Library or in any other local library, you can use our interlibrary loan service (ILL). This will provide you with literature from all over Germany and abroad.

Please note: You may only order items that are not available locally via ILL. This means that if you are based in Munich please visit Munich libraries (e.g. the Bavarian State Library) yourself. You can only order them through TUM from the Garching, Weihenstephan or Straubing campuses.

#### 2.4.2 Who can use ILL and what does it cost?

- All University Library users with a valid library card
- Within Germany: books - free of charge, copies – working fee
- International ILL: price depends on shipping charges
You can borrow items via ILL using Gateway Bayern (the union catalogue of the Bavarian Library Network):

- Interlibrary loan within Germany
- International interlibrary loan

### 2.4.3 Interlibrary loan within Germany

Our central search and ordering platform for ILL is “Gateway Bayern”. You can search Gateway Bayern and order books and articles from other German libraries via the website www.gateway-bayern.de:

![Gateway Bayern website screenshot]

### 2.4.4 Interlibrary loan for books

Use the simple search or the advanced search to find the book you need. In the lower part of the full display on the result page you will see a list of all the libraries where the book is available. If none of your local libraries is listed here, you can order the book via ILL. Click on the SFX button.
You will reach the SFX page again:

Choose your branch library location (Munich, Garching, Weihenstephan or Straubing) and log in to your account entering your University Library user number and password. Confirm by clicking "weiter".
You need to enter the following information in the order form (see next page).

You will see customer and delivery details in the upper left part of the form. Borrowing books via ILL is free of charge within Germany. Choose the branch library where you want to pick up your book; you can also fill in a date after which the delivery would be too late for you. This date must be 14 days in the future, because the delivery can take up to 14 days. However, we will deliver as soon as possible.

You will find the most important information about the book (title details) in the lower half of the display. Please let us know if you would accept a different edition as well, and check all the details before you submit the order.
You will be informed via email, when the book is ready for picking up. The standard loan period is four weeks starting from the date of the email.

2.4.5 Ordering journal articles via interlibrary loan

It is also possible to order copies of journal articles via Gateway Bayern. Please note however, that you will only find journal titles, not titles of journal articles. Therefore, we recommend searching for the journal title or the ISSN. Now click on the desired title. If you have the choice, please use always the printed version.
You will find a list of all the libraries that currently hold the journal in the full display. However, this does not tell you where the volume you need is available. Once again, SFX will help you: Click the SFX button and choose the option “Bestand im Bibliotheksverbund Bayern” (holdings in the Bavarian Library Network).
This will give you an overview of where the volume you need is available and if ILL is possible.

Example: The volume 2009 is available at the Bavarian State Library. Therefore, ILL is possible only from our branch libraries in Garching, Weihenstephan and Straubing. If you are a user of our branch libraries in Munich, we will need to borrow the book directly from the Bayerische Staatsbibliothek.

If you want to borrow the article via ILL, please close this overview and go back to the SFX menu. Click on “Bestellung über dokumenTUM oder Fernleihe” (ILL via the Bavarian Library Network),
mark “dokumenTUM oder Fernleihe” and log in to your account. Click again on “dokumenTUM oder Fernleihe”.

Now you find your personal data and have to choose the branch library where you want to pick up the ordered media.
You only need to fill in the year and the volume of the journal article you want. And order via “Fernleihbestellung abschicken”. Articles from journals or books will be delivered to you as a paper copy. A small fee (€ 1.50) for expenses will be charged. You will be informed via email as soon as the copy arrives in the library. Please note that journal articles ordered via ILL will not be displayed in your online account (however, books will).
2.4.6 International interlibrary loan

You can still place your interlibrary loan order via Gateway Bayern even if you do not find what you are looking for in German libraries. If you receive the prompt "No matches were found for your search" or you cannot find the title you want, click on "Additional Services" in the menu above and select the link "Interlibrary loan (only for users of libraries in the Bavarian Library Network)".
Then submit your order by choosing one of the following options:

- Interlibrary loan request (book)
- Interlibrary loan request (copy from a book)
- Interlibrary loan request (copy from a journal)

You will receive the ILL order form after logging in to your account. Please fill in the required information and our document delivery team will find out which library provides the desired literature.

Before ordering from abroad, you will always be informed of the approximate costs which depend on the country. You can then decide whether to accept them or to cancel the order.

### 2.5 Alternative sources for journal articles

The university library provides you with access to more than 40,000 scientific journals, which you may read and download. Nevertheless there are not always enough funds available, to license all journals or all volumes of a journal.
If you don’t have access to an article at the TUM, then you often have the chance to use alternative paths to obtain scientific articles, usually free of charge:

- use printed versions of journals
- explore online resources free of charge
- contact authors or your scientific community
- share your articles as an author
- order articles from publishers and document delivery services for a fee

For more information please go to the website https://www.ub.tum.de/en/news/alternative-sources-journal-articles or search in A - Z under “Alternative sources”.

3 How do I use references properly?

Reference management programs help you to collect and organize the results of your literature search. They can support you in:

- Collecting files and references
- Sorting and structuring your literature sources
- Keeping an overview, especially for a longer period
- Creating reference lists
- Automatically integrating citations in your word processing program

A lot of reference management programs are available. Members of the University Library may use free campus licences for Citavi and Endnote. For further information, see: https://www.ub.tum.de/en/reference-management.

If you need more information about reference management programs, we recommend “Comparison of Reference Management Software” https://mediatum.ub.tum.de/1127579?show_id=1320978. There you can find details about other programs.
4 How can the University Library support me?

4.1 General questions

If you have questions or need further information, please contact the First Level Hotline:

Email: information@ub.tum.de
Telephone: +49 (0)89 189 659 220
WhatsApp: +49 (0)173 861 84 12
Chat: www.ub.tum.de

4.2 Want to know more about reference management program and citation?

For queries concerning the reference management programs Citavi and Endnote or citation problems we offer the following services at TUM:

- Email: literaturverwaltung@ub.tum.de
- Courses about reference management software Citavi and Endnote
- Course “Cite it right”
- Lecture Notes: “TUM Citation Guide” https://mediatum.ub.tum.de/?id=1225458
- Reference Management and Citation Drop-in Session

In addition to our courses, we offer a drop-in session for individual questions every week. You find details on our homepage (www.ub.tum.de/en/workshops).

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