POLITECNICO
MILANO 1863

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Thesis instructions tutorial

Scope and content of this tutorial

Target audience:

- MSc students in Urban Planning and Architecture
- But also valid for Bachelor students

Introduce students to:

- How to choose the thesis topic
- Introducing students to thesis pathway and revisions
- How to clearly define the hypothesis and the research question
- How to structure the thesis workplan and text
- Tips on templates, references and printouts
- Tips for the presentation during the defense

Starting point

Before starting

You should know:

- Duration of the process: at least 6 months… but do not go above 1,5 year.
- The thesis is an independent study: each individual has its own needs, times, personal conditions and situations.
- Theses of 2 students are allowed: in that case you have to carefully agree on common directions and commitments.
- The supervisor will not make you any pressure and you decide the timeline of the work.
- However, try not to delay and extend the work for too long, otherwise the supervisor loses interest in the topic.

Starting point: How to choose the thesis topic?

Firstly, ask yourself:

1. What are my main interests? What is the topic I really am interested in?
2. Formulate your hypothesis (strong and triggering)
3. Information and data acquisition should be accessible in a short time and manageable! Feasibility is crucial!
4. Think about the methodology of the work, based on your skills or the skills you want to acquire during the thesis path (be ambitious but realistic…)
5. Where do I want to go after the thesis completion? What are my future plans

→ Remember: The thesis is a relevant presentation for your future career (either professional or academic), hence invest enough (time and effort) on it!

Starting point: How to choose the supervisor?

… too late for asking

What type of thesis?

- Theoretical research thesis: a bibliographic essay, collection and cataloging of material; reconstructing a theoretical framework
- Empirical research thesis: based on quantitative or qualitative research methods
- Design thesis
- A mix of the previous three typologies, paying attention to a proper balance

First exercise for you: 1 thesis proposal in 8 slides

Prepare a quick slideshow to discuss with your supervisor, one slide per bullet point as below:

1. **Problem statement**
2. Formulate the **objective** and the **main research question** clearly and explicitly:
    - What is the hypothesis?
    - Provide one simple sentence
    - Make the main research question explicit
3. Eventual **sub-questions** to deepen the main question and inform the exploratory phase
4. **Expected impact** (wide impact on society, environment, economy)
5. **Expected result**
6. **Expected outcome** (product)
7. **Originality**/added value: in which way is your work original compared to state-of-the-art?
8. **Methodology**: how to respond to your question? which methodology are you going to apply?

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Thesis pathway and revisions

Thesis pathway and revisions

- The thesis emerges as the result of a fruitful dialogue between you and the supervisor; it is your independent study directed by the instructions from the supervisor. The supervisor is not a certifier of paperworks.

Hence,
- do not disappear once you have established the topic
- do not arrive at the end of the path with a final product that was never discussed with your supervisor (it happened!)
- Never complete the online application and submission of the work before asking and discussing with your supervisor
- Be open to get tips and suggestions
- try to update your supervisor regularly
- have a review once a month, in average

Thesis pathway and revisions

When you are getting close to the end:

- Inform your supervisor at least three months ahead on your intention to graduate in the next session
- At the sametime, three months before submission, prepare a draft presentation (ppt or similar) to present the whole pathway with the almost completed tasks and results, highlighting what is still missing and present this material during a thesis revision.
- Submit the draft text one month before submission to enable your supervisor to give you effective tips with reasonable time.

If you do not follow these deadlines, you are going to be asked to move to the next graduation session.

Thesis structure

Thesis structure: Main content

- Title
- Abstract
- Introduction
- Research context
- Methodology
- Application / Experimental phase
- Outcomes / Discussion of results
- Conclusions and future work
- Bibliography
- Appendix
- List of figures
- List of tables

Typical content according to a scientific structuring of a thesis work.
Similarly, a research work or article is structured in the same way.

Thesis structure: Title

Title

In order to define the title I propose the following method:

- Firstly, identify 5 relevant keywords
- Secondly, out of these keywords, try to derive a title

In order to make it effective, use a brilliant and short title:
and a subtitle that describes what you did

You can find some examples on my previous theses (consult https://www.politesi.polimi.it/simple-search?query=morello&submit.x=0&submit.y=0)

Thesis structure

Abstract

Ita / Eng (1 page) : summary of the thesis, including everything: premises, objective, methodology, application, outcomes and conclusions.

Thesis structure

Introduction

- Mission and premises
- Background and issues raised
- Objectives
- Impact of the work
- Application to a case study
- Methodology
- Short description of the chapters (1 paragraph per chapter)
- It can (it should!) repeat some of the content of the abstract

Thesis structure

Research context

This part of the thesis aims answering the question: where are we now? What is the the state-of-the-art? This work will provide the baseline to understand if your hypothesis and research questions was already investigated/answered by other scholars; here you understand how your work could potentially go beyond the state-of-the-art.

Literature on …. would be reviewed from studies and publication by ….

The aim of the literature review would be to…..

The review of literature would then extend to ….

Literature review:

- scientific articles, books
- Laws, norms, policies
- best practices review
- Chronicles and facts concerning the case-study application
- Other type of “context” to better frame the thesis proposal

Literature review: How can I find scientific articles or books?

First of all: rationale and keywords

Why am I searching for an article or a book?

To answer a research question! Or to explore an issue...

*Thus, try to find the **keywords** to sum up the main elements of your question/issue.*

Examples of (scientific) search tools:

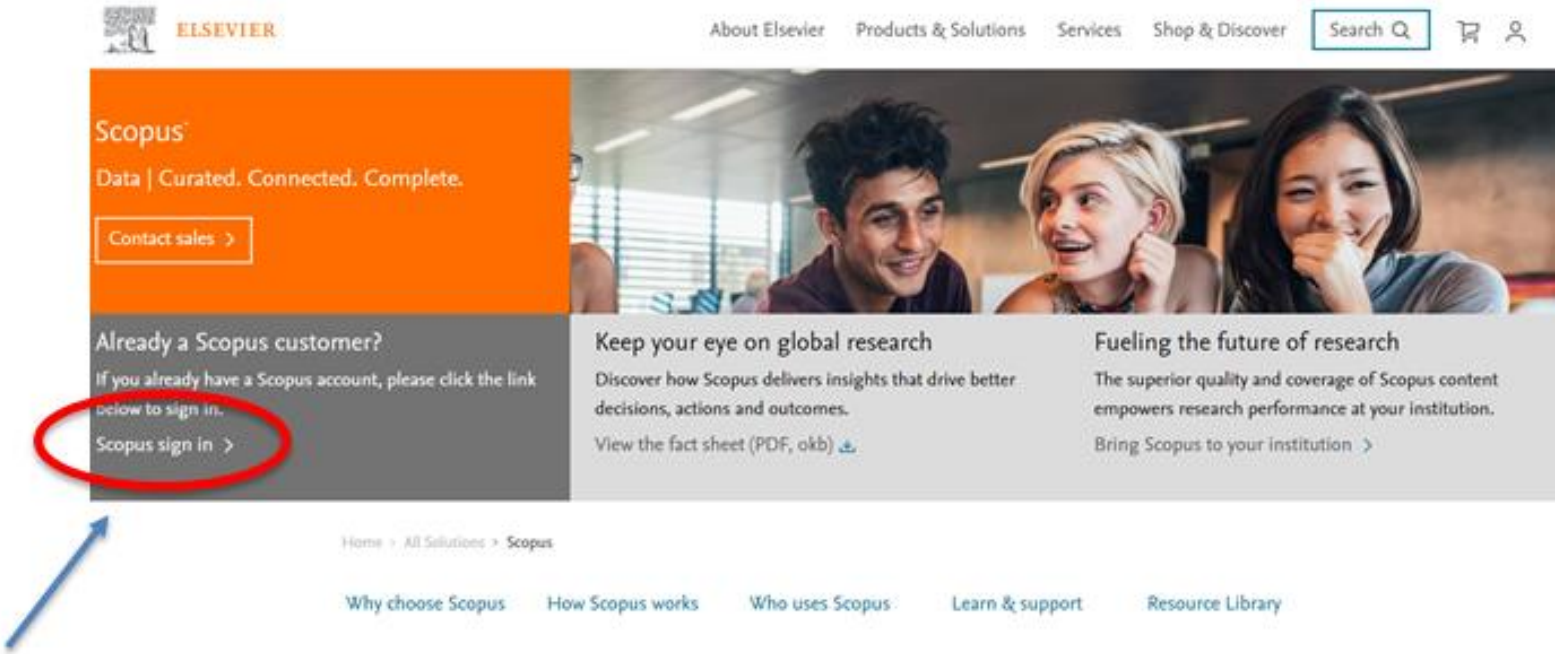
- Scopus
- Google Scholar
- https://books.google.com/ngrams

Literature review: How can I find scientific articles or books?

Scopus

Useful **steps** to use Scopus:

1.Sign in using your **Institutional account**



Literature review: How can I find scientific articles or books?

Scopus

Useful **steps** to use Scopus:

1.Sign in using your **Institutional account**

2. Search for articles using **identified keywords**

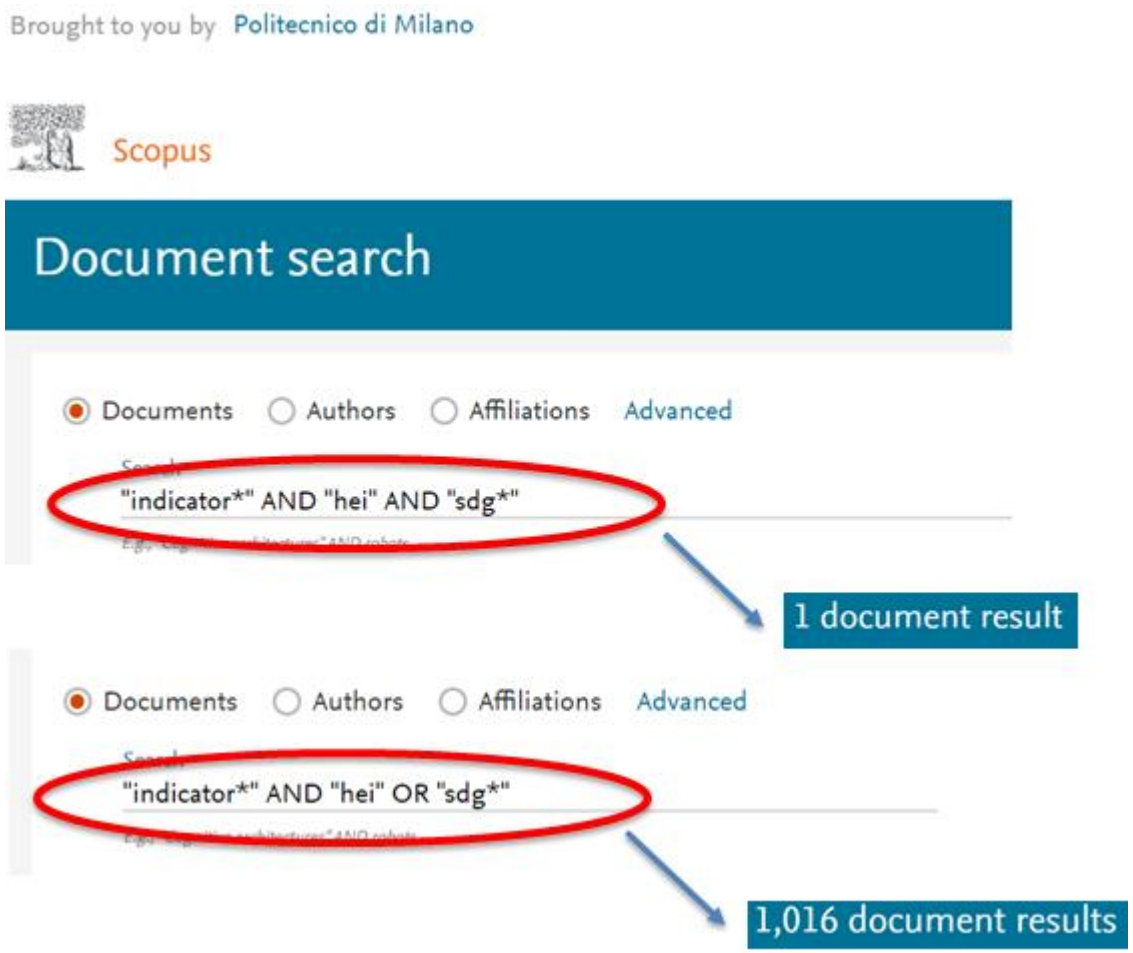
Keep in mind that:

•**Title, abstract and keywords** are the **default search fields** of Scopus. Indeed, these three fields usually contain the most relevant information;

•Use **double quotations** to search phrases or to create a search string, as in the example;

•**Combine keywords** with operators such as **AND** and **OR**, e.g. "heart" **AND** "brain". This would limit the search results to **only those documents containing the two keywords**. Instead, use **OR** when **at least one of the terms must appear** (such as **synonyms**, alternate spellings, or abbreviations);

•Use ***** to include **plurals**.



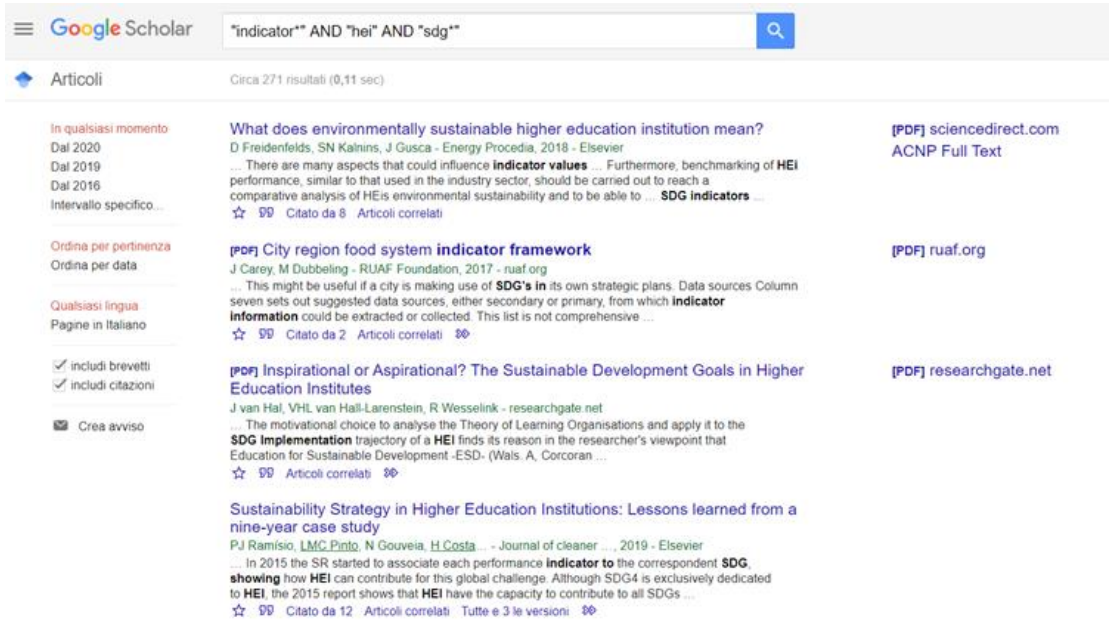
Literature review: How can I find scientific articles or books?

Google Scholar

Google Scholar and Scopus have similar search rules (AND, OR).

However, in Google Scholar:

- **no registration** is needed;
- the default search field is not limited to TIT-ABS-KEY; the tool searches for your keywords throughout the text. Indeed, using the same search string (“indicator*” AND “hei” AND “sdg*”) Scopus found 1 document, Google Scholar found 271 documents.



Thesis structure

Methodology

- Describe here the method of the thesis and the structure of the investigation
- Research design: describe all the steps you conduct to answer your research question
- Research analysis
- Data collection: which data and why, specify sources, modality of data collection
- Literature review can also be considered methodology if specific analysis and procedure to analyse and structure literature is used.
- The criteria chosen for the investigation
- Assumptions
- Limitations: very important to recognize and declare eventual limitations in data acquisition, elaboration to clarify the limits of the exploration (time, $, skills…).
- Novelty of the methodology: the exploration and experimental part comes here.

Thesis structure

Application / Experimental phase

- Case study application
- Description of the application
- comprehensive analysis (qualitative and quantitative)
- Limits of the application

Thesis structure

Outcomes / Discussion of results

- Results of the experimental work
- Outcomes: product(s) of the work
- Interpretation of results

Thesis structure

Conclusions and future work

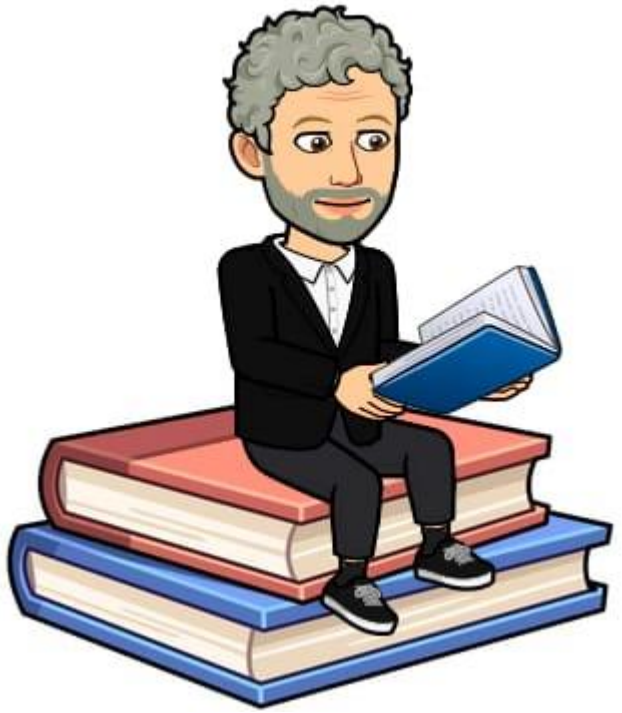
- Short summary of the thesis
- Comments on the path and on the results and outcomes
- Highlight again the limitations of the study, if any
- Evaluation of the impact of the work
- Future work

Thesis structure

Bibliography

- APA style or Harvard Style
- Possibly do not distinguish websites, books… all together
- For websites, always insert «retrieved on…», because online content becomes old very quickly
- PLEASE, PLEASE, use Word References, for automated citation and bibliography generation; as alternative or in addition to Word Reference, install:
  - Mendeley
  - or Zotero

  … these tools will simplify your life in the organization of literature references!



Thesis structure

Appendix

Why?

- Move to the appendix those parts that do not add any novelty to the text (sheets, forms, norms, surveys formulae…) or make the reading difficult
- Supplementary material: relevant for validation, evidence of some work, but not crucial for the overall understanding of the thesis
- It is a way not discarding conducted work
- Examples: interviews, forms, surveys, data collection in general

Thesis structure

List of figures

List of tables

- optional
- at the beginning or the end of the thesis
- including the credits, sources of the material
- page of appearance in the text

Style

Style: general recommendations

- PLEASE, PLEASE, use Office Word for the automated generation of
  - citation and bibliography
  - management of table of content
  - insertion of footnotes, captions and numbering of images

If you really suffer to see the poor and standard layout obtained by Word, you can move to InDesign or similar, of course, but PLEASE PLEASE, do it at the very end of the work, when everything is fixed and frozen.

Check the language

To check the language you can use:

- **Grammarly** (also as plug-in for Office Word): https://www.grammarly.com
- **Deepl**: https://www.deepl.com/translator

Plagiarism

- Never copy and paste text from other sources without citations!
- Many softwares provide an analysis of plagiarism and it is going to be used soon by all universities to scan the final document when uploading the thesis online.
- Always make citations of «original extracts of text and report the author « (Author, year).
- If you have long parts of a chapter inspired by one main reference, simply mention at the very beginning and provide the main source immediately and repeat it along the text. Do not worry about providing multiple citations by the same author if this reference is crucial and essential for your work! and the author is a leader in your topic.

Style: thesis book layout

The layout should be simple, clear and elegant.

- Consider that a full text page should have about 2000 words.
- Not too small layouts.
- A4 format has a reason why it is so popular… hence
- You can use other formats, like book style dimensions
- Squared design is loved by students, but it creates a lot of limitations; it is justified only in specific works where the square plays a specific role in the visual content (e.g. maps, samples based on a squared grid).

Printouts of the book

- Provide three copies of the thesis for the committee
- However, save the environment, reduce printing:
    - print front and back
    - do not waste too much space for internal covers (be compact!)
    - avoid too much ink and colors

Additional material for the presentation

Not required, but helpful in some cases to complement the slideshow presentation:

- Poster: one or more panels, large format (useful and ready material if you want to submit the work to a conference)
- A3 albums
- Physical models

Thesis style: general tips

To sum up the main tips, as a **CHECKLIST, please make sure that…**

- Citations in the text appear with (author, year)
- All the citations in the text have to be reported in the bibliography and vice versa.
- Number all the figures and tables and mention them all in the text
- Provide a list of figures and tables at the end of the thesis or at the very beginning
- A full text page should have about 2000 words
- If you use images that are not produced by you, please insert the source and credits
- Print both sides of the page and avoid wasting paper
- Be very clear at the beginning of each chapter: what is the aim, what you will present in the chapter, how it links to the previous part of the thesis. Always give back the general overview and the links among the parts here. I also suggest entering text boxes at the beginning of the chapter (In this chapter I'm going to introduce…) or at the end of the chapter (In this chapter we have learned …)

Managing your time

Manage your time

- don’t get stressed
- don’t waste time
- how to approach writing

- make a workplan (match chapters with a timeline)
- manage your daily time in a clever way
- avoid final rush (be fit for the defense!)

http://blogs.nature.com/naturejobs/2014/08/07/top-tips-on-writing-your-phd-thesis/

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Presenting and defending your thesis

Presenting your work during the defense

How to engage your audience \ **yourself**:

- Be relaxed and fit on the graduation day (sleep well the night before)
- Try to keep the presentation within 20-25 minutes max (15 minutes for Bachelor)
- Please prepare your talk carefully in order to respect the given time for the presentation!
- Keep eye contact!
- Modulate your voice and underline (slower and laughter) the main content: avoid monotony! Insert some breaks in the discourse, some intermezzo, anectodes, even funny ones and jokes… be brilliant!

Presenting your work during the defense

How to engage your audience \ **the speech**:

- keep your speech clear and simple; don’t run if you think your discourse is too long
- make the listeners life easy: clearly accompany the committee through the main ideas and overall picture and intentions of the work
- avoid creating expectations or leaving the audience questioning all the time “where the hell will this guy end up with this work?”... the thesis defense is not about providing a surprise effect (lol) and receive applause! it is more about conving the committee about the scientific solidity of the work with the given constraints.

Presenting your work during the defense

Tips for the slideshow \ **structure**:

- make the objectives and the research path of the work clear from the very beginning (a workflow would be ideal; avoid reading the table of content...)
- try to address the main topics and the added value of your work within the first 5 minutes (max. attention); in case, you can introduce the main findings immediately and then describe how you achieved this result!
- hence, avoid postponing the very interesting parts at the end (the risk that the committee asks to cut is always very high)

Presenting your work during the defense

Tips for the slideshow \ **style**:

- use a simple and clean template (do not waste space with decorations or banners - names of authors and thesis title can be very little or just appear on the cover); the slide layout should not turn to become an obstacle for presenting th content; do not be too rigid and strict with the layout
- make use of more visuals than text in order to keep the attention of the committee (you can simply talk instead of reading the text on the slide)
- avoid to exactly read what you write on the slide
- do not provide too much text per slide and highlight the important content (keywords) using bold text to ensure legibility.

Presenting your work during the defense

Tips for the defence \ **answering the questions**:

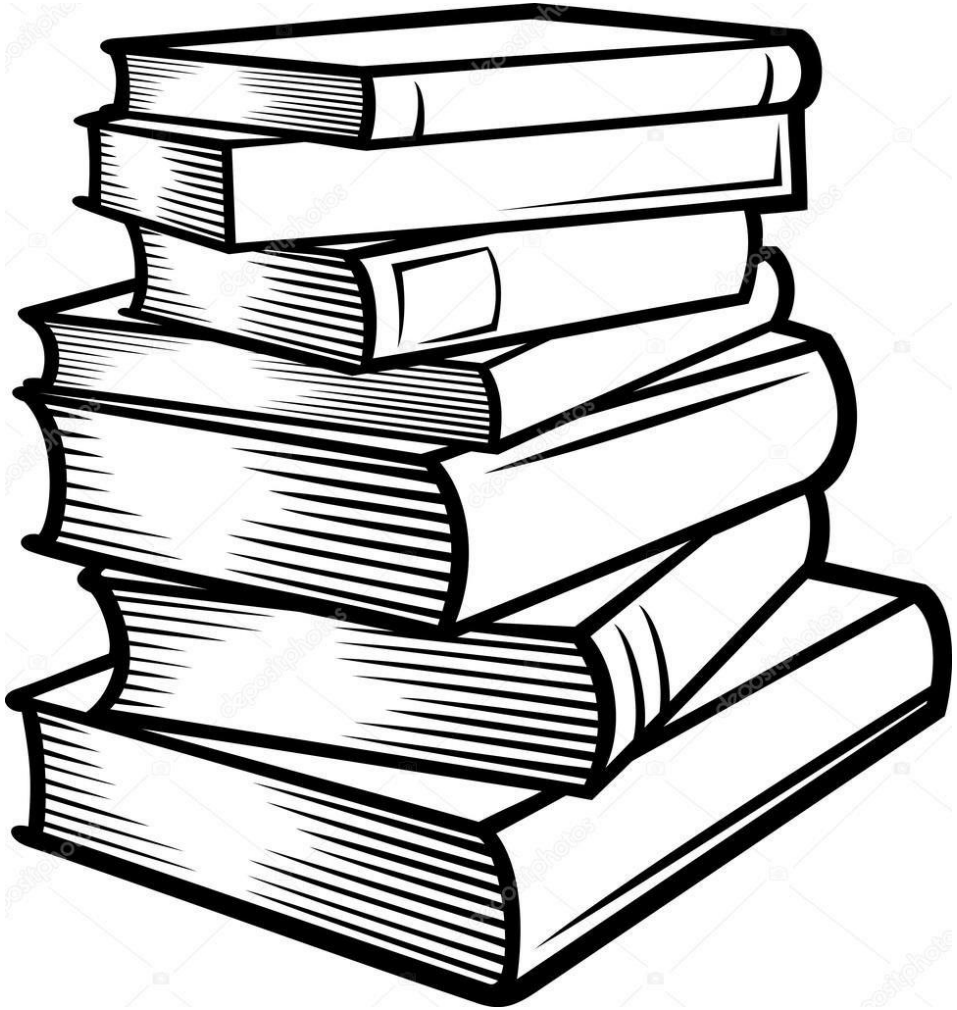
- It is an important part in the final evaluation;
- First of all, don’t be nervous;
- If the question highlights a weakness of your work, just recognize it as part of the limitations of your work (with more time, with more resources… this is what I want to do next!);
- If you do not know the answer, try to set (…improvise) a logical reasoning to try finding the answer; make some hypotheses.

Conclusions

Take away

- spending enough time in choosing the topic and exploring literature and data in the initial phase is a good investment to go faster later
- the thesis is a scientific work, maybe the first in your life: a solid scientific method will make your life easier
- a good organization of incoming information and data and the clever management of time are crucial
- the presentation of you final work plays an important role in the overall evaluation of the work
- the thesis stays with you longer than expected and is a presentation card for your future career… invest on it!

References and recommended readings



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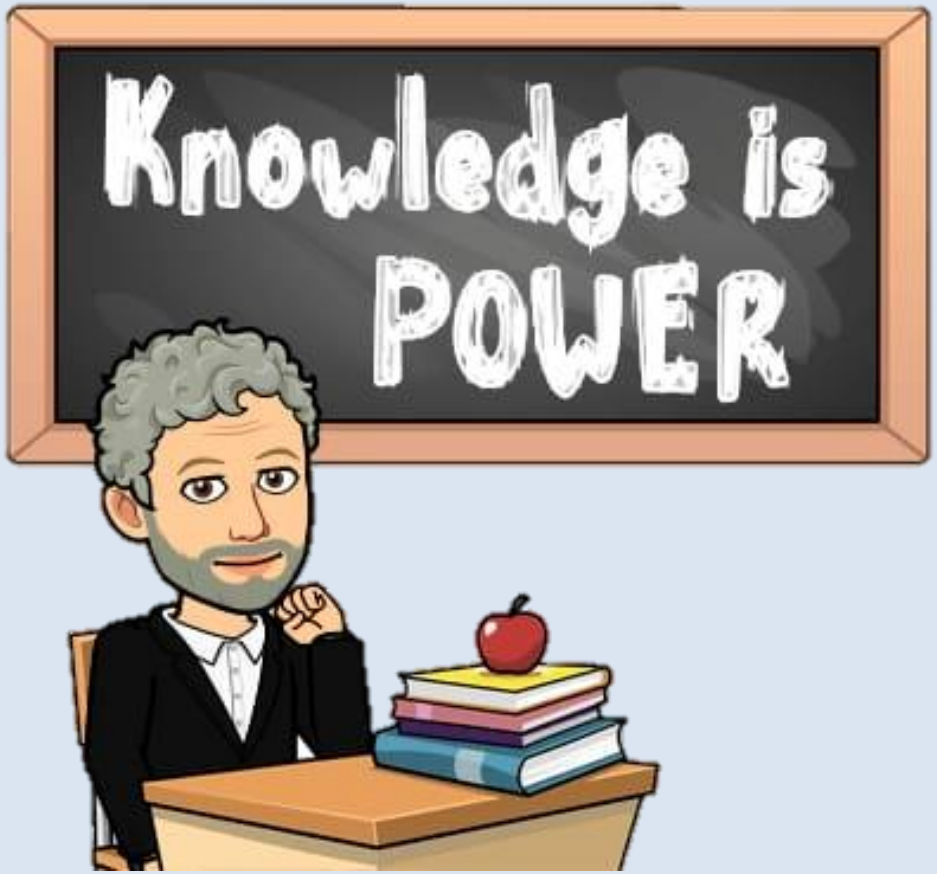

Thank you for attention!