



The oral presentation

Topics

- Key principles
- Storyline and structure
- Supporting slides
- Discourse
- Quiz



Key principles



Focus on the audience

- An oral presentation is
 - communicating with an **audience**
 - in order to share a **message**
 - generally based on **slides**.
- The important is what the **audience** understands, thinks and remembers!!!



Key principles



Both define the “how?”:

- visual + oral **discourse**
- supporting **slides**

Audience

- The **context** (location, time, ...) of the presentation can also influence the “**how?**”.



Key principles

① Define your objectives

- Goals
- Key messages

② Adapt to the audience

- Needs and expectations
- Technical background

③ Maximize signal-to-noise ratio

- Only the **essential** (key messages)
- **Simple** and **visual**

④ Use efficient redundancy

- Targeted **repetitions** (e.g., speech/slides)
- Verbal and **non-verbal communication**

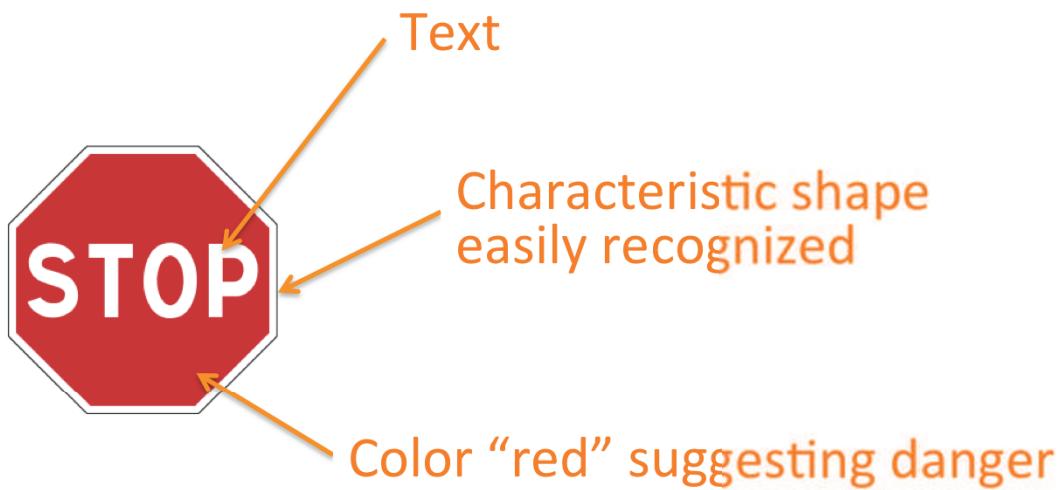
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- Think about what you **want to achieve** with the presentation:
 - convince your boss to invest money;
 - sell something;
 - promote your new solution;
 - ...
- Adjust your presentation to the technical **knowledge of the audience**.
- **Repeat** the message as often as necessary for the audience to understand and remember it, but use **targeted redundancy** (i.e., repetitions by different means):
 - complementarity between the oral presentation and the slides;
 - complementarity between verbal and non-verbal communication.



Key principles

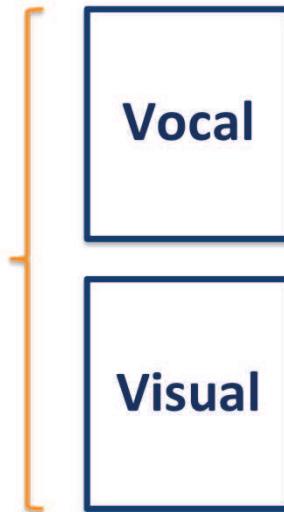
Example of efficient redundancy – The “stop” sign





Key principles

Non-verbal communication



- Tone and its variations
 - Speed and diction
 - Volume
-
- Look and facial expressions
 - Posture
 - Gestures



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- **Vocal** communication:
 - Find the right balance;
 - Adapt to the situation.
- **Visual** communication:
 - Our **look** expresses our feelings and makes **contact** with the audience.
 - Our **facial expression** and **posture** echo our feelings.
 - Our **gestures** and **moves** have to serve the speech (i.e., reinforce the weight of the words).
 - But **parasitic** moves and repetitive gestures often distract the audience.



Key principles

An oral presentation is everything
but improvisation!!!



Key principles

Main steps

1. Plan the presentation
2. Create the presentation
3. Create the support
4. Rehearse
5. Prepare the stage
6. Give the actual presentation
7. Answer questions



- The following slides will focus on these three aspects:
 - storyline and structure;
 - supporting slides;
 - discourse.



Storyline and structure

1. Planning



- Why? Who? What? Where? When?
- Define the objective
- Identify key take-home messages

2. Creating



- Select the content
- Create storyline (logical flow)
- Focus on the essential

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- Think about what you can **leave out** without compromising your main message.
- The storyline should be constructed based on a **logical** and **not chronological** flow.
- Use a clear **structure** and **reference points** for the audience (especially when no supporting slides are used).



Storyline and structure

Introduction

- “Attention-catcher”
- Context / motivation / objectives
- Main message
- (Outline)

Preview

Body

- Methodology
- Results
- ...

Transitions

Conclusion

- Summary
- Main message
- Acknowledgement (funding, ...)
- “Final word”

Review

- The **attention-catcher** can be
 - a reference to recent news,
 - a personal experience,
 - an anecdote,
 - ...
- The last slide can contain the **contact information** (email, website, ...).



Supporting slides

Only a support to help the audience understand

- For efficient redundancy (not for the show)
- Self-consistent ...
- ... but not exhaustive
- If you don't talk about it, don't show it!

- Different tools can be used (e.g., **PowerPoint**, Keynotes, LaTeX).
- PowerPoint (or alike) usually gives more flexibility than LaTeX.



Supporting slides



- 1 message per slide
- Visual
- Less is more
- No spelling mistakes

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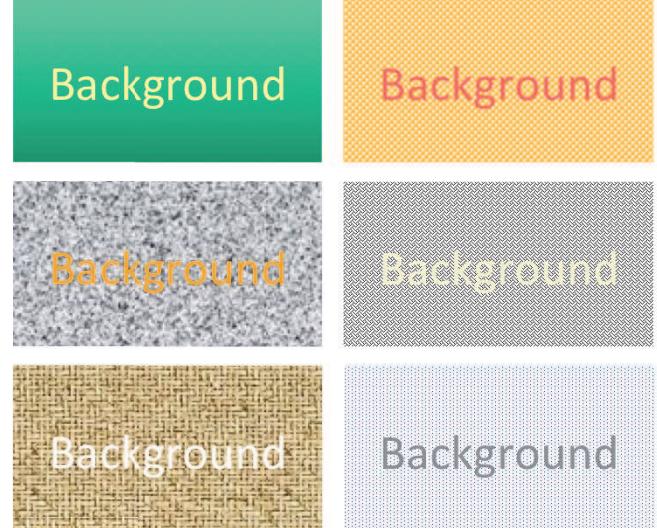
- One usually counts **1' to 2' per slide.**
- But some slides take less than 1', some others take more than 2'. So practice to adjust your timing.
- Translate as much **text** as possible into a **graphical** representation.
- **Minimize** the amount of **text** as much as possible (no full sentences but keywords).
- **Avoid equations** (if not possible, time should be spent to describe and explain them).
- **Avoid tables.**
- Avoid any **distracting features** (transitions, animations, etc.).
- You can add information **gradually** on the slide to guide the attention of the audience.
- Be careful if you use a **laser pointer** (e.g., shaking hands, too many moves, ...).



Supporting slides

Layout and style

- No background (even for title)
- No disturbing elements
- Logo only on title page
- Only page number in footer
- Aesthetic, uniform, readable



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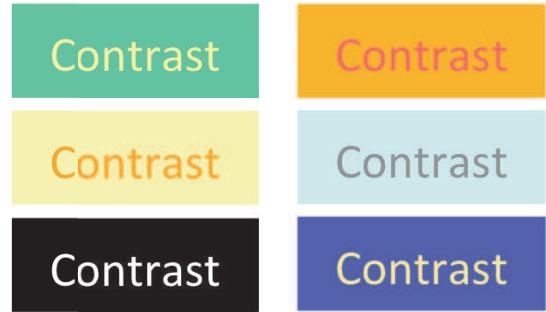
- The best is simply a **white background**.
- The **page number** is important for the audience to get back to a specific slide during the discussion/question part.
- Do not use all the possible (crazy) **functionalities** of PowerPoint.
- Eliminate any **unnecessary** element.



Supporting slides

Layout and style

- No background (even for title)
- No disturbing elements
- Logo only on title page
- Only page number in footer
- Aesthetic, uniform, readable



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- Avoid **colors** that are **not visible** on the screen (bright green, yellow, pastel tones, ...).



Supporting slides

Layout and style

- No background (even for title)
- No disturbing elements
- Logo only on title page
- Only page number in footer
- Aesthetic, uniform, readable

Font
Font } **Arial or alike**

Font

Font

Font

Font

Font

Font

Font

Font

Font

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- **Times Roman** type is usually better adapted for a longer text in **printed** form (written report, newspaper, ...).
- **Arial** (or **Helvetica**) type is usually better adapted for shorter text and on **screen** (slides, webpage, ...).
- The slides of this presentation are done with **Calibri**.



Supporting slides

Layout and style

- No background (even for title)
- No disturbing elements
- Logo only on title page
- Only page number in footer
- Aesthetic, uniform, readable

10 pts → Font

Font

Font

Font

Font

Font

24 pts → Font

Font

Font

Font

Font

Font

44 pts → Font

- The font size should be **at least 20 pts**.
- The font size should be ideally **adapted to the room** (and projector, screen) in which the presentation takes place.
- The font size of the text on these slides is usually 24 or 28 pts (title size is 36 pts).



Supporting slides

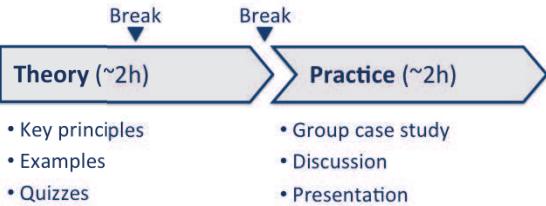
Translate text into graphics

- logical connections
- structure
- relative importance

Format of the workshop

- We will have first a theoretical part that will last about 2 hours
 - In there, we will discuss the key principles of communication
 - We will look at different examples
 - You will test your understanding through several quizzes
- For the remaining two hours, we will give you the opportunity to practice the theoretical aspects discussed during the first part
 - You will perform a specific case study by groups of three students
 - Your will then discuss your results with another group
 - Finally, you will present your solution in front of the class
- We will have a break in the middle of the first part and between the two parts
- During the entire workshop, we expect your active participation

Format of the workshop



Active participation expected!

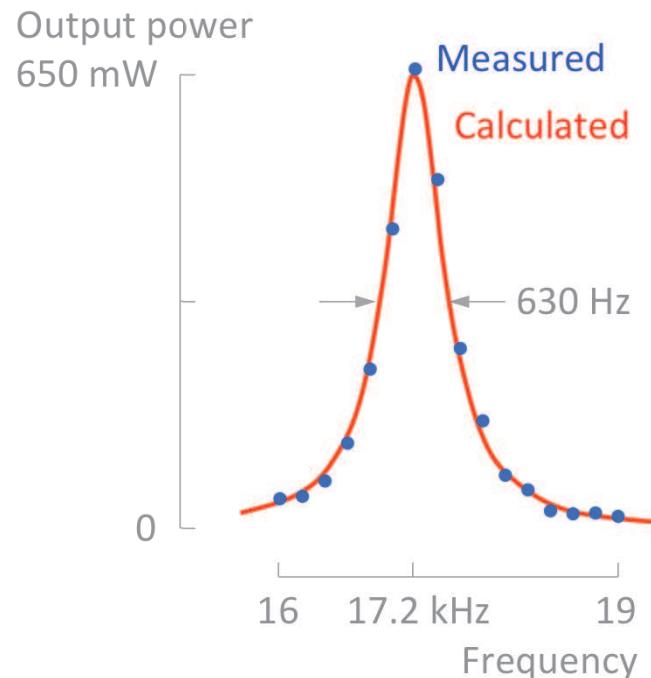
- When preparing your slides, for each text/sentence, think about how you could show/translate it graphically.
- If **movies** are shown, make sure that they can be played on the computer that will be used for the presentation.



Supporting slides

Figures

- Different from written report
- Only important information
- No caption
- Thick lines
- Visual elements
- Highlight important points



Adapted from J.-L. Doumont "Trees, maps, and theorems" (Principiae, 2009)

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- Usually, a slide should not contain more than one figure.
- The goal is not to present all results, but **selected representative** ones in order to convey your message.
- Use the **same color** for the legend as for the line it corresponds to.
- **Emphasize the data**, not the axes and their corresponding titles/labels (e.g., axis lines thinner than data lines, dark gray, etc.).
- Do not overload the figure with many axis **ticks**, keep only the ones necessary to understand the figure (e.g., min and max).

Supporting slides – Bad examples



A time-frequency technique for the stability analysis of impulse responses from nonlinear aeroelastic systems

John Smith & Robert Blake
School of Engineering
University of Manchester



THE UNIVERSITY
of MANCHESTER

CLI Method

Basics of the method: Nonlinear curve-fit and form of nonlinear function

$\mathbf{N}(t) = -\ddot{\mathbf{q}} - \tilde{\mathbf{L}}[\dot{x}_1 \dots x_{i-1} x_{i+1} \dots x_{2m}] + \hat{\mathbf{A}}\mathbf{w}(t)$

Nonlinear Result

$$\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} \begin{bmatrix} \dot{y}_1 \\ \dot{y}_2 \end{bmatrix} + \begin{bmatrix} 2.7471 & -0.6596 \\ -0.6903 & 3.8485 \end{bmatrix} \begin{bmatrix} y_1 \\ y_2 \end{bmatrix} + 10^4 \begin{bmatrix} 1.1096 & -0.3121 \\ -0.2795 & 0 \end{bmatrix} \begin{bmatrix} y_1 \\ y_2 \end{bmatrix} + \begin{bmatrix} 0 \\ N_2(y_2) \end{bmatrix} = \begin{bmatrix} 0.3486w_0(t) \\ 0.3303w_1(t) \end{bmatrix}$$

Linear Result

$$N_2(y_2) = \begin{cases} 1.9994 \times 10^4 y_2 + 2.4574 & \text{if } y_2 < -5.0 \times 10^{-4} \\ 1.5285 \times 10^4 y_2 & \text{if } -5.0 \times 10^{-4} \leq y_2 < 5.5 \times 10^{-4} \\ 2.1850 \times 10^4 y_2 - 3.4083 & \text{if } y_2 > 5.5 \times 10^{-4} \end{cases}$$

Identified nonlinear function

Presentation Skills

- Unreadable
- Too much information
- No clear structure



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Results



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Discourse

Be prepared

- Rehearse / practice (timing, content, questions)
- Get feedback
- Check your presentation on the projector ahead of time (size, colors, movies)
- Have a backup copy on a USB stick (.pptx + .pdf)
- Prepare the stage

Being prepared will reduce your stress level!

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- The goal is to give the presentation **without reading** the notes and respect the timing.
- It is very useful to **record** (voice and/or video) your practice session.
- Remove chairs and other **obstacles**.
- The audience should fully **see** the **presenter** and the **screen**.



Discourse

Be natural

- Speak clearly and loudly
- Face the audience
- Do not read your slides (even the title)
- Prepare your first and last sentences
- Be confident and enthusiastic

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- Make sure not to stand between the audience and the screen.
- Use a microphone if available.
- Choose where to best stand (on the left or right of the screen).
- Make sure you know the shortcuts to control the presentation (forward, backward, jump to a page, ...).
- For PowerPoint:
 - “w” => white screen,
 - “b” => black screen,
 - 12<return> => jump to page 12.
- The audience cannot listen, read and think at the same time!
- You need to guide the audience through the presentation (use reference points in the oral discourse and on the slides).
- Do not hide your hands, and smile.



Discourse

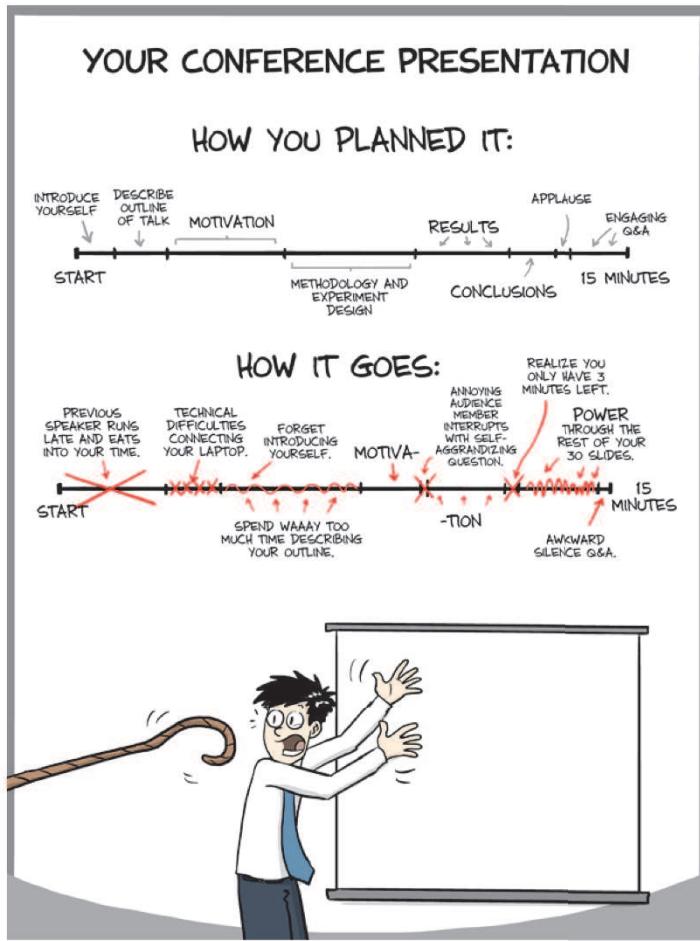
Answering questions

- Try to **anticipate** potential questions
- **Do not interrupt** the person asking
- Possibly, **re-formulate** the question
- **Think** before answering
- Give a clear, short and structured response
- Address the **entire** audience

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- You can prepare a few **backup slides** with additional details to respond to potential questions.
- **Rephrasing** the question
 - allows you to make sure you understood the question,
 - gives you some time to think about the response.

Try to avoid this ...



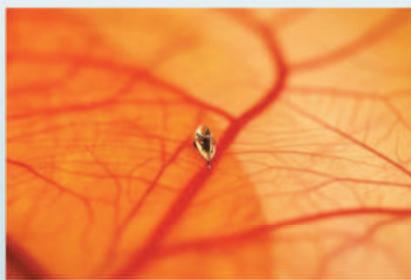
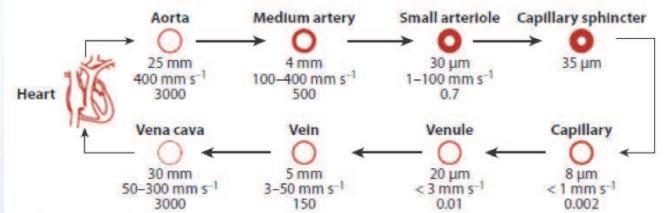
Quiz – How can we improve this?



2

What are they ?

- Devices at some tens to hundreds micrometers scale used to carry out simple functions



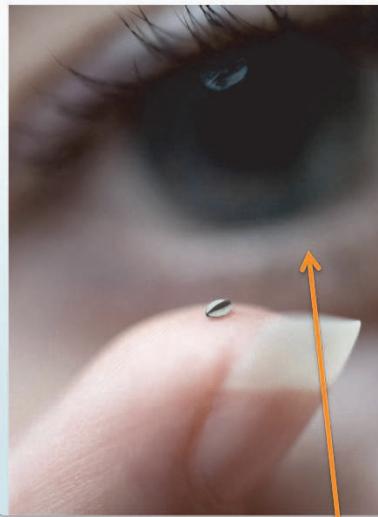
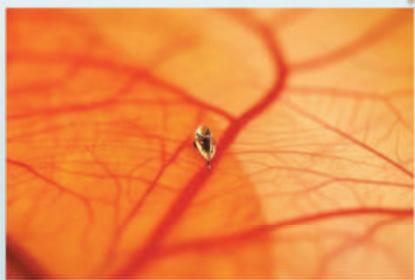
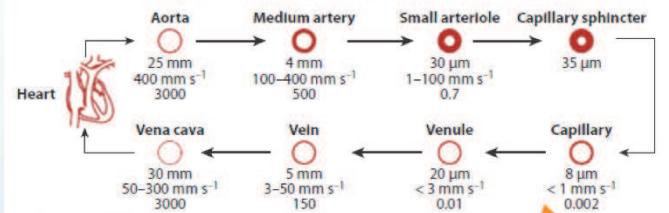
Quiz – How can we improve this?



2

What are they ?

- Devices at some tens to hundreds micrometers scale used to carry out simple functions



Do not put a background

Increase font size,
indicate number
meaning

Crop!

Quiz – How can we improve this?



Technical feature : Self-alignment by folding

- + Passive alignment mechanism provided by folding
- + Paper of thickness $h \rightarrow$ Elastic energy of bending $\sim h^3$
 - Order of error $\sim h$
 - Need to minimize the error
- + Closed structural loop between the optics stage and the illumination stage

Quiz – How can we improve this?



Technical feature : Self-alignement by folding

- + Passive alignement mechanism provided by folding
- + Paper of thickness $h \rightarrow$ Elastic energy of bending $\sim h^3$
 - Order of error $\sim h$
 - Need to minimize the error
- + Closed structural loop between the optics stage and the illuminantation stage

Show logical
structure
graphically

Do not put a
background

Spelling mistakes

Quiz – How can we improve this?



Mirror plate 1mm *1mm above the mirror chip of 2mm*2mm

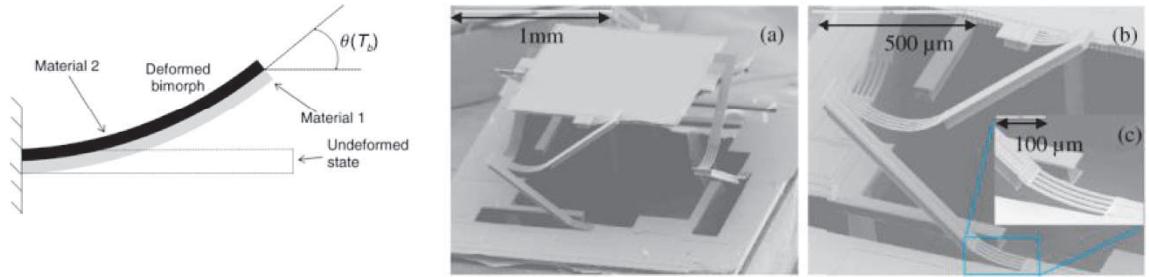
→ Fill factor= $1/4 = 25\%$

→ Range of $+ -30^\circ$

Suspension actuators linked by bimorph beams which flex with variation of temperature. (bimorph beams are made of SiO₂ and aluminum).

→ one warms the beams with the joule effect → Current consumption.

→ Geometrical parameter must be calculated in order to compensate the lateral shift and tilting of the vertical displacement



Quiz – How can we improve this?



Mirror plate 1mm *1mm above the mirror chip of 2mm*2mm

→ Fill factor = $\frac{1}{4} = 25\%$

→ Range of $\pm 30^\circ$

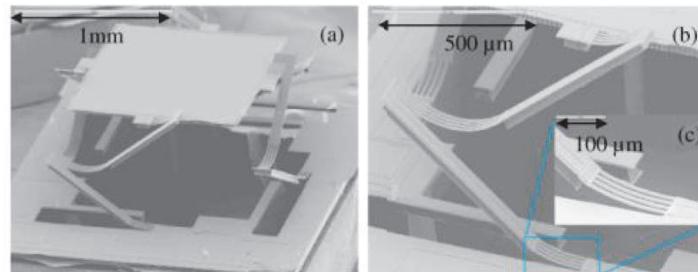
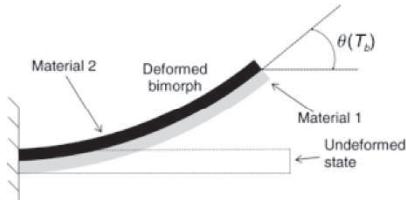
Too much text

Suspension actuators linked by bimorph beams which flex with variation of temperature. (bimorph beams are made of SiO₂ and aluminum).

→ one warms the beams with the joule effect → Current consumption.

→ Geometrical parameter must be calculated in order to compensate the lateral shift and tilting of the vertical displacement

Use schematics



Spelling mistakes



The literature review

Topics

- Key principles
- Tools



Key principles

Identify and read existing relevant literature

What?

- Published research related to your work
- Journal articles, books, patents, ... (avoid websites)

Why?

- To support your argumentation
- To make sure no one has already done the work
- To learn more about the topic
- To gather data for validation
- To find new ideas

How?

- ULg library website
- Google scholar, Scopus, ...

Wikipedia is not an adequate source!

Tools



lib.ulg.ac.be

The screenshot shows the homepage of the ULg Library website. At the top, there's a navigation bar with links like 'Les bibliothèques', 'Comment...', 'Patrimoine', 'Open Access', 'A propos de nous', 'Invité', and a search bar. Below the navigation is a main content area with sections for 'BRÈVES' (News), 'ACTUALITÉS' (News), and 'DERNIERS TUTORIELS' (Latest Tutorials). The 'BRÈVES' section contains tweets from the ULG Library account. The 'ACTUALITÉS' section has an article about ORBi and another about summer library hours. The 'DERNIERS TUTORIELS' section shows screenshots of Google Scholar import and search advanced features. A sidebar on the right lists links like 'e-journals (liste A-Z)', 'Bases de données...', etc.

- Other **search engines** are for instance CiteSeer, ScienceDirect, Scopus, ...
- You can also directly consult the websites of specific **journals** or **editors** (Elsevier, Taylor and Francis, Springer, Wiley, Cambridge, ...).
- A large number of journals and resources are available **free of charge through the university** (you need to be on the ULg network or through VPN).
- If the title is not directly available online, consult the **ULg library**.
- Do not hesitate to ask the **library clerks** for help.

Tools



Google scholar

The screenshot shows the Google Scholar homepage. At the top, there are links for 'Web', 'Images', 'More...', 'Sign In', 'My library', 'My Citations', 'Alerts', and 'More'. Below the header is the Google Scholar logo. A search bar contains a placeholder 'Search' and a 'Search' button. Underneath the search bar are two radio buttons: one selected for 'Articles (✓ include patents)' and another for 'Case law'. A green banner below the search bar reads 'Stand on the shoulders of giants'. At the bottom of the page are links for 'About Google Scholar', 'Privacy', and 'Terms'.

[PDF] The local structure of **turbulence** in incompressible viscous fluid for very large **Reynolds numbers** leeds.ac.uk [PDF]

AN **Kolmogorov** - Dokl. Akad. Nauk SSSR, 1941 - homepages.see.leeds.ac.uk
Ua (P)= u (x1, x2, x3, t), x= 1, 2, 3, the components of velocity at the moment t at the point with rectangular cartesian coordinates x, x2, x3. In considering the **turbulence** it is natural to assume the components of the velocity u,(P) at every point P=(x1, x2, x3, t) of the ...
Cited by 5257 Related articles All 13 versions Cite Save More

Also indicates impact / quality of paper

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- To obtain a list of **publications** that have cited a specific manuscript: Google Scholar, Scopus, Web of Science, Thomson ISI, CiteSeer
- To find **patents**: Google Scholar, proVendis Patenfibl, United States Patent and Trademark Office, DEPATISnet, PROvendis, easyPatent, European Patent Office, ...
- To find **substance data**: NIST Chemistry WebBook, WebElements, ChemFinder, Perry's Chemical Engineer's Handbook, CRC Handbook of Chemistry and Physics, ...

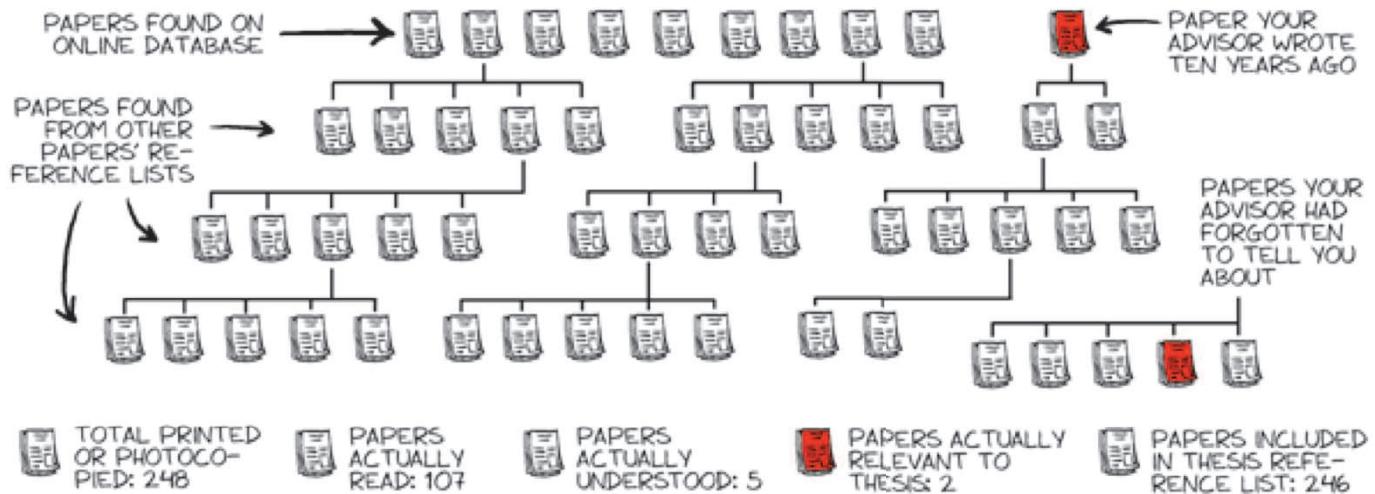
Literature review



REFERENCES

MAKING SURE NO ONE HAS ALREADY WRITTEN YOUR THESIS

phd.stanford.edu
JORGE CHAM © STANFORD DAILY





Writing in English

Topics

- Key principles
- Some common mistakes
- Quiz



Key principles



- Previous comments still apply
- Do not write long complex sentences
- If it makes no sense in French, it does not make any sense in English either
- Stick to either **US** or **UK** English
- Use **spell check!**

Some common mistakes



Correct

- does not
- in Fig. 1
- ... following points:
- we have ...
- an unsteady simulation
- a uniform flux
- 3.1415
- etc.
- the first two examples
- 10% is too much
- there are a lot of
- I wonder where Peter is
- modeling

Wrong

- doesn't
- on Fig. 1 / at Fig. 1
- ... following points :
- we has ...
- a unsteady simulation
- an uniform flux
- 3,1415
- ...
- the two first examples
- 10% are too much
- there is a lot of
- I wonder where is Peter
- modelization

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- In English, the order is usually “**first name**”, then “**last name**”: John Smith (instead of Smith, John).
- **Suffixes** like –st, -nd, -rd, -th are often not placed as exponent: 2nd (instead of 2nd).



Some common mistakes

Correct

- gas
- negligible
- proportional
- approximately
- spatial
- another
- to determine
- to evolve
- amplifier
- lubrication
- to meet requirements
- to carry out a test
- to conduct a survey

Wrong

- gaz
- negligable
- proportionnal
- approximatively
- spacial
- an other
- to determinate
- to evaluate
- amplifacator
- lubrification
- to reach requirements
- to realize a test
- to lead a survey



Some common mistakes

Base
Feel
Lose
Price
Quite
Still
Rise
Electric
There
Insulate
Resistor



Basis
Fall
Loose
Prize
Quiet
Always
Raise
Electrical
Their
Isolate
Resistance



Some common mistakes

Experience
Petrol
Realize
Arrive
Conception
Society
Large
Installation
Actually
Important
Problem



Experiment
Oil, petroleum
Conduct, perform, do
Occur, take place, happen
Design
Company
Wide
Facility
Currently
Big, large
Topic, issue, question, subject

Fake cognates

Quiz – How can we improve this?



“While the class, the students did several experiments.”

“Despite they made efforts, most of them failed the exam.”

Quiz – How can we improve this?



~~“While~~ the class, the students did several experiments.”

While they were in class,
During the class

~~“Despite~~ they made efforts, most of them failed the exam.”

Despite their efforts
In spite of their efforts
Although they made efforts,

Quiz – How can we improve this?



So, the discrepancy was considered too big.

“As the world population grows, the demand for food and energy, which is today mostly provided by fossil resources, will increase as well.”

Quiz – How can we improve this?



~~So, the discrepancy was considered too big.~~

Therefore, large

“As the world population grows, the demand for food and energy, which is today mostly provided by fossil resources, will increase as well.”

As world population grows, the demand for food and energy will increase as well. This development will additionally increase the pressure on fossil resources.

Quiz – What is the correct word?



I need a microscope to ~~conduct~~ ~~realize~~ my ~~experience.~~ experiment.

High-tech ~~societies~~ companies will also suffer from a shortage of ~~petrol.~~ oil.

This ~~problem~~ ~~topic~~ only ~~occurs~~ ~~arrives~~ at high temperature.

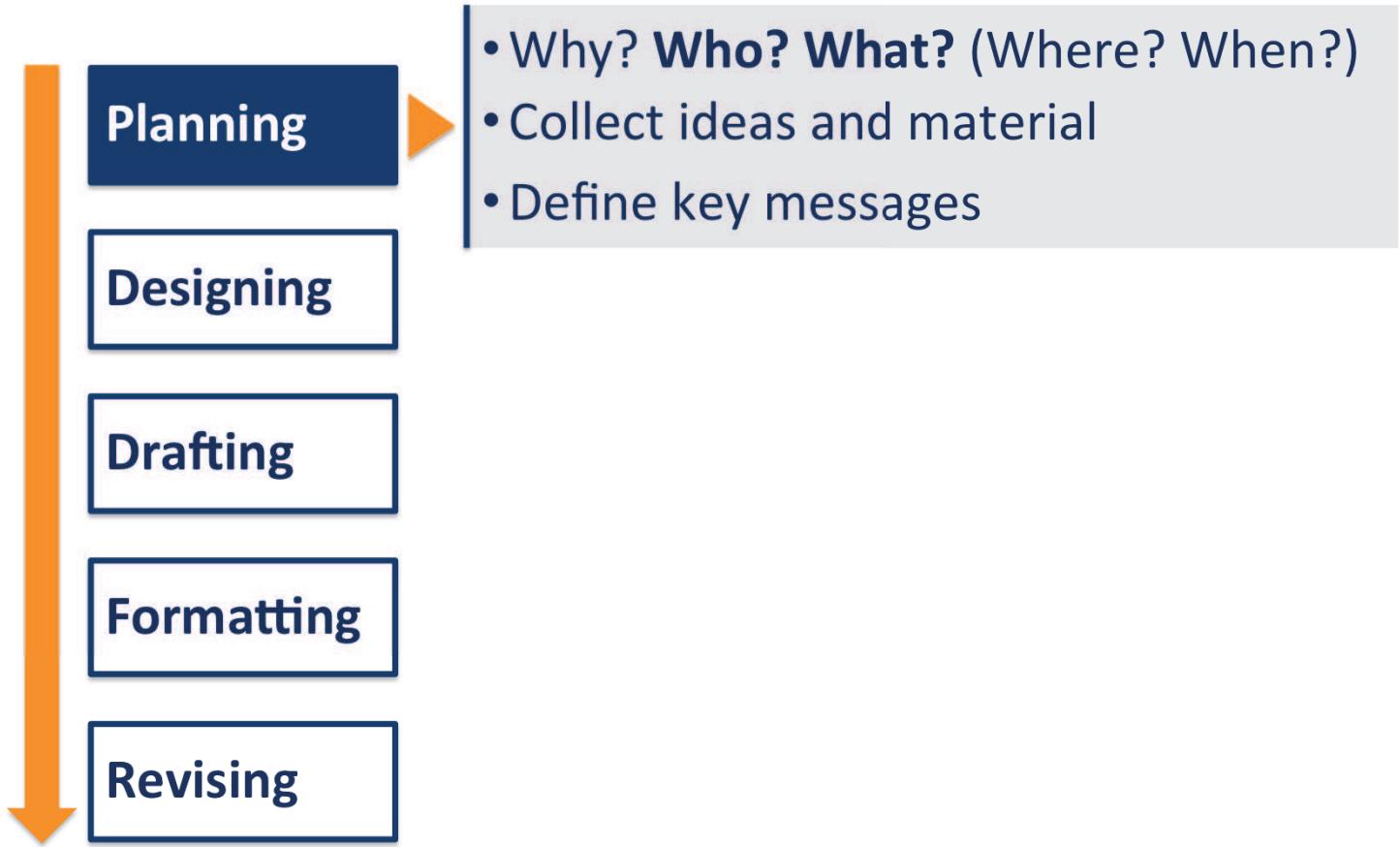
I used to do aircraft ~~design,~~ ~~conception,~~ but I am ~~actually~~ currently unemployed.

Conclusion

How to proceed?



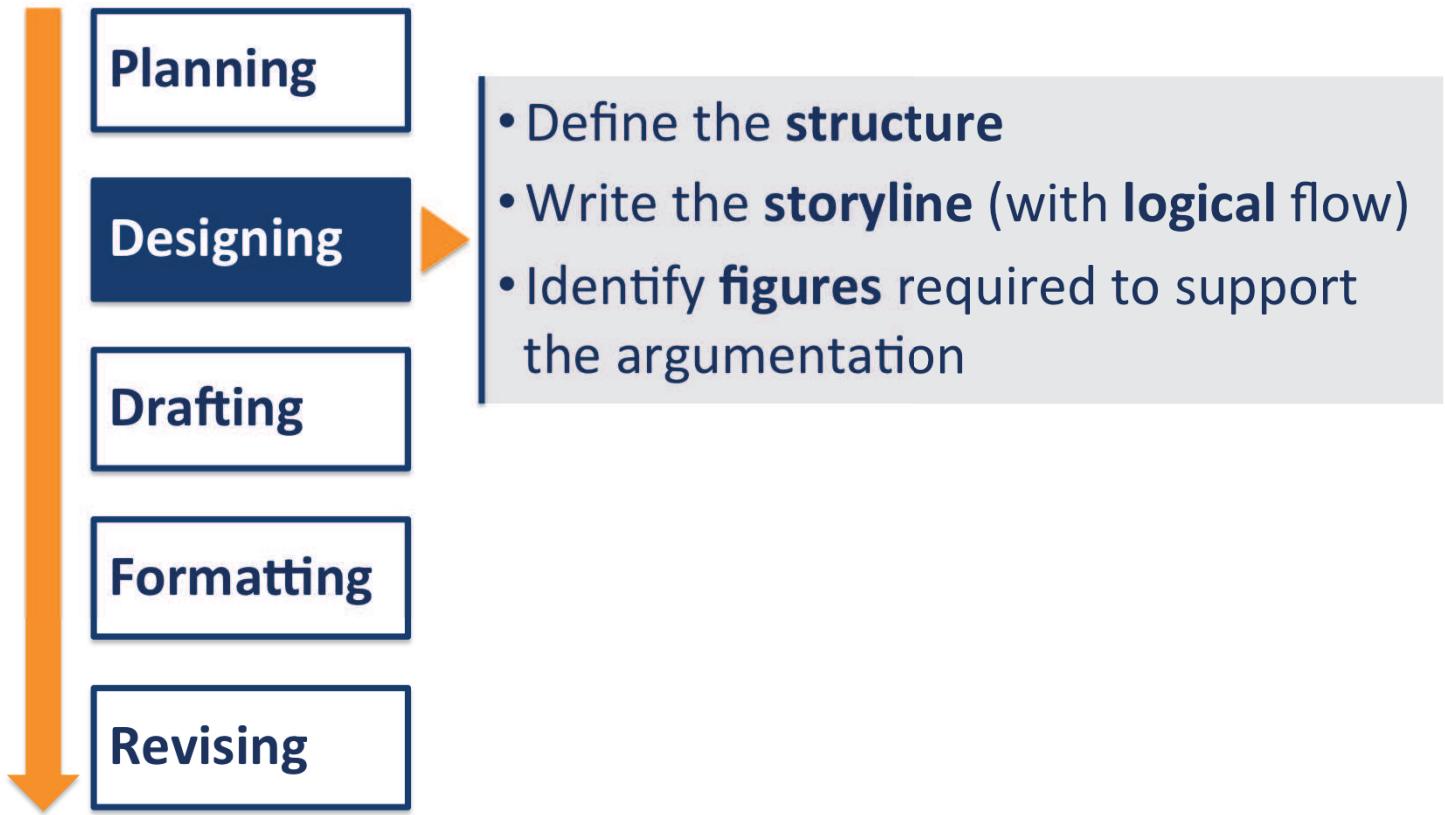
How to proceed?



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- Let it **rest** for some time
- You can add ideas when they come into mind

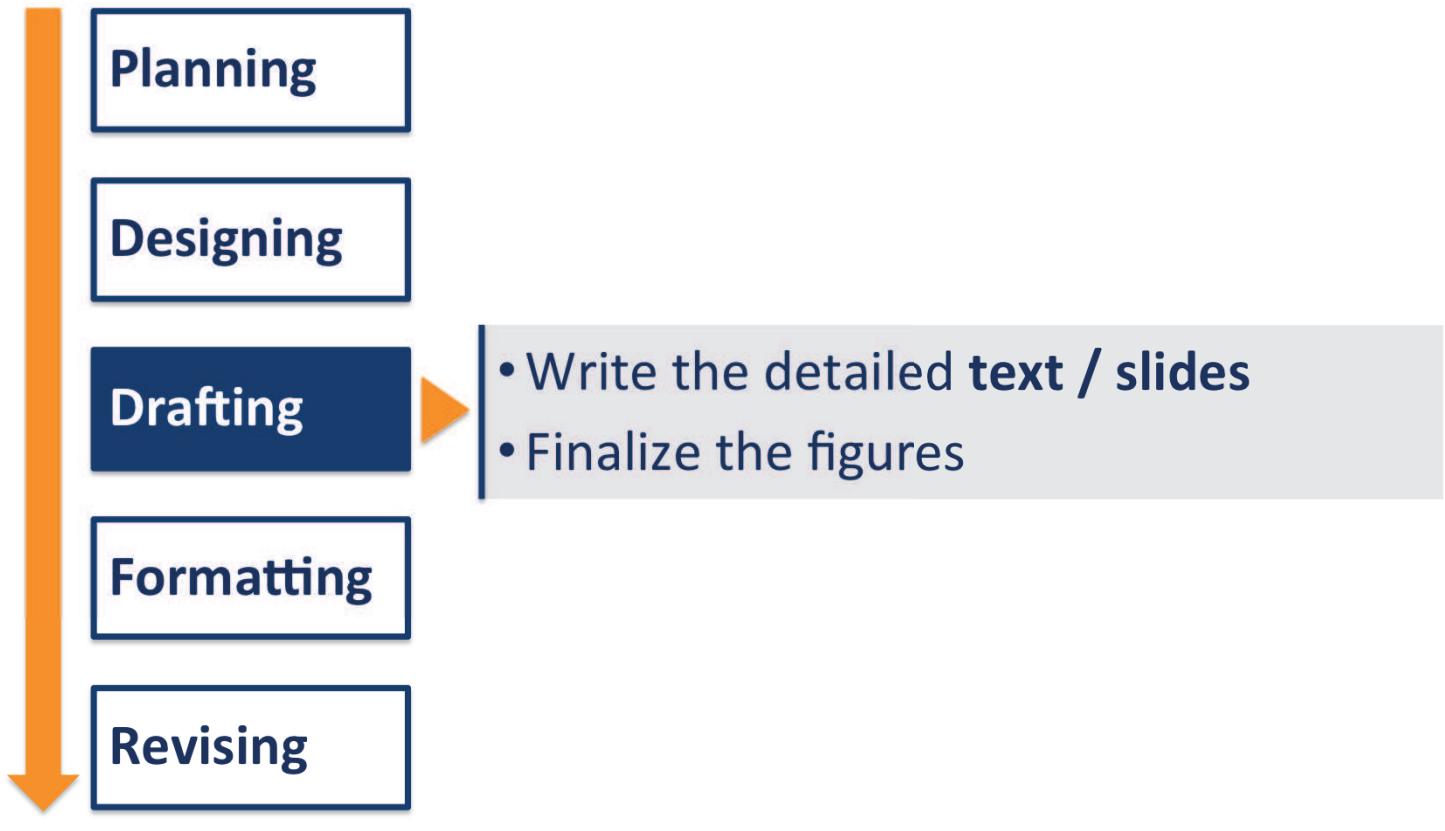
How to proceed?



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- **Iterate and optimize** a few times
- A useful approach to create the storyline is to work with **bullet points** and include logical connectors

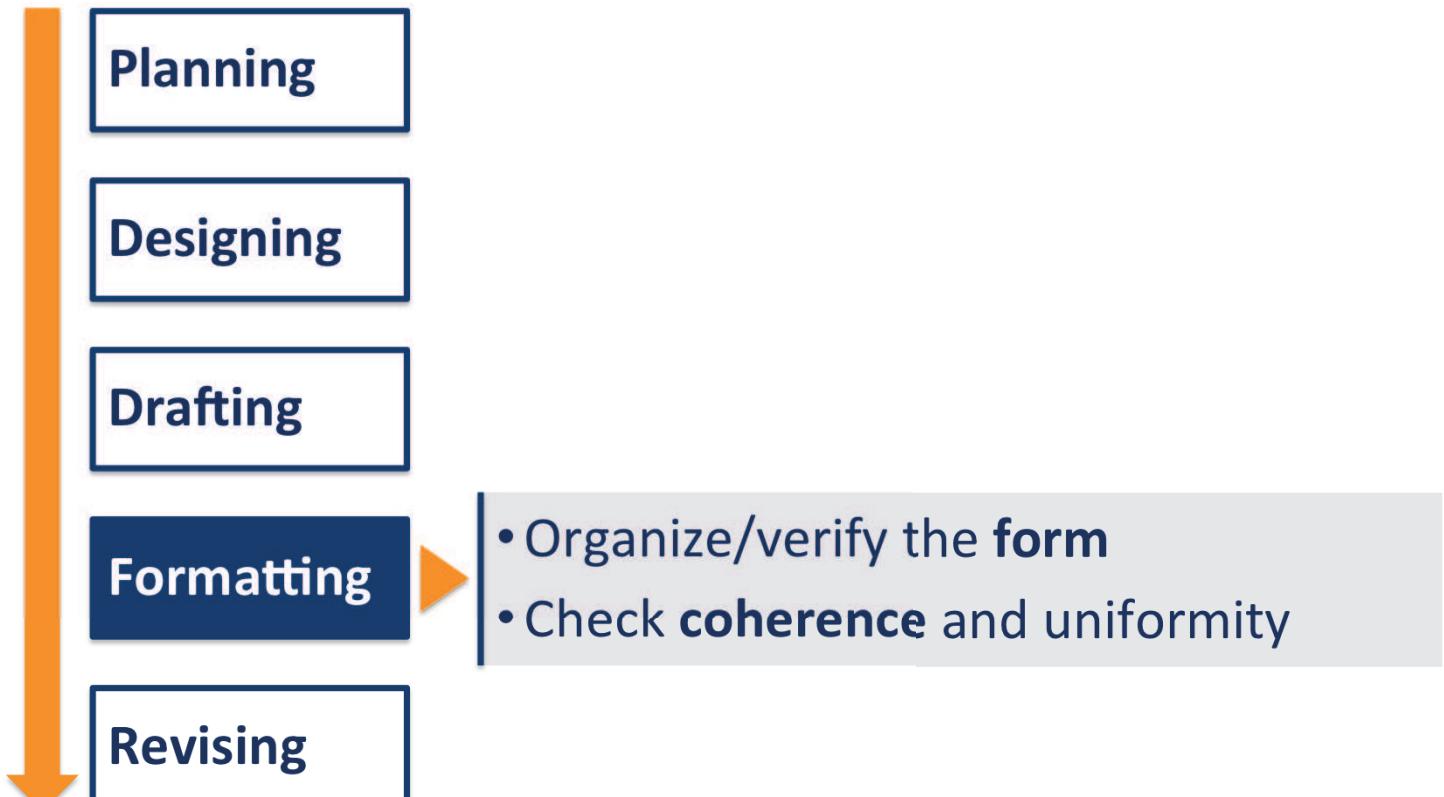
How to proceed?



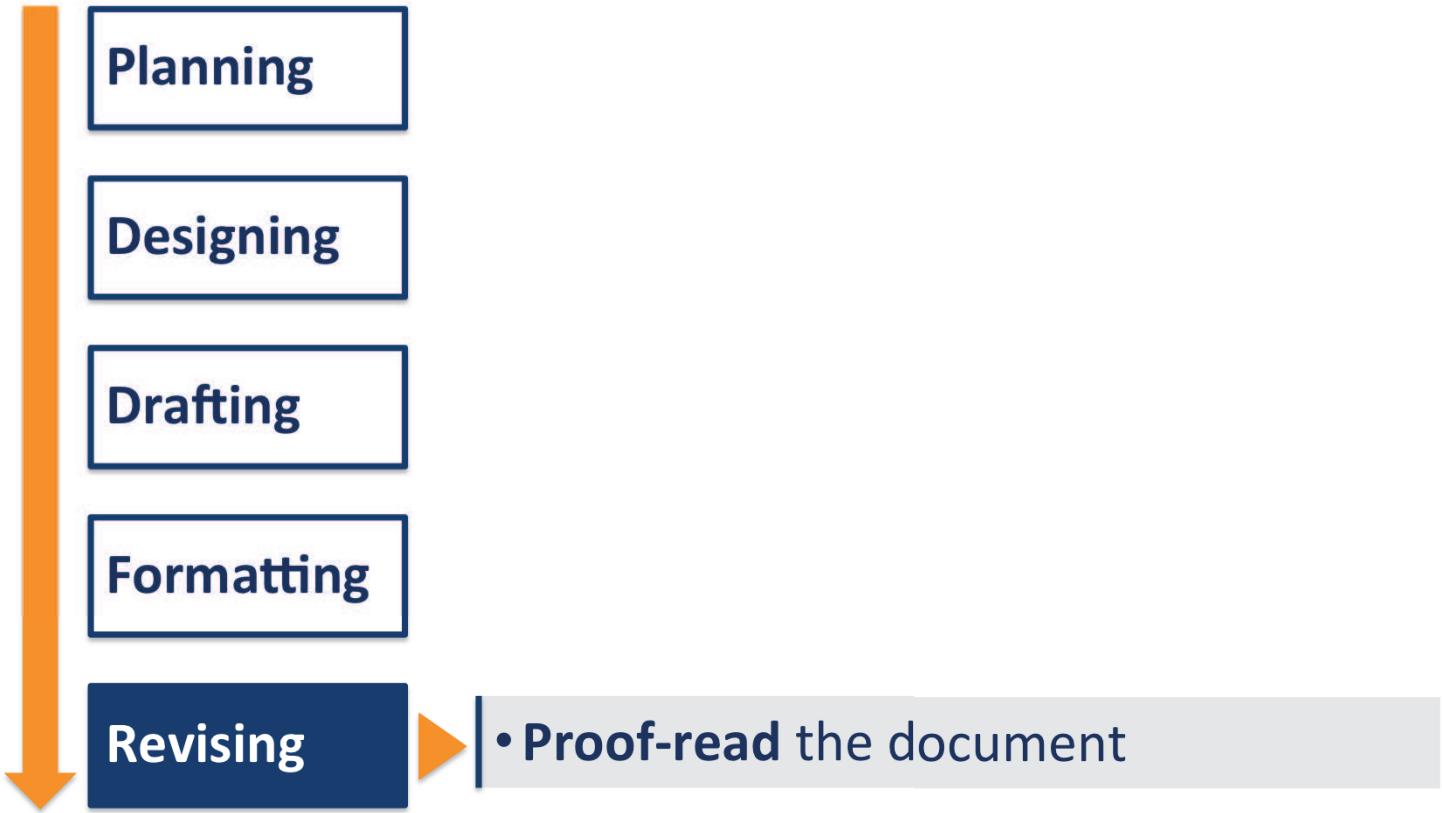
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- Do not start with the introduction or conclusion but rather with chapters / sections where you did most of the work
- Let it **rest** for some time before reading it again

How to proceed?



How to proceed?



- Wait 1 day or 2 before reading again your report

A final word

The reader / audience should always be the focus!

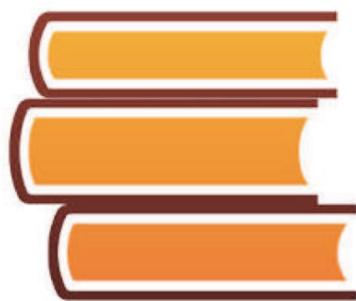


- Read your report / slides and **check** all the points discussed
- Ask others for **feedback**
- Seek inspiration from **examples**
- More experienced people are not always good examples...

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- These principles also apply to **other forms of communication** or a different context
 - **Emails** (keep in mind the required level of formality)
 - Written and oral **exams**
 - Informal **discussions**
 - ...

Resources



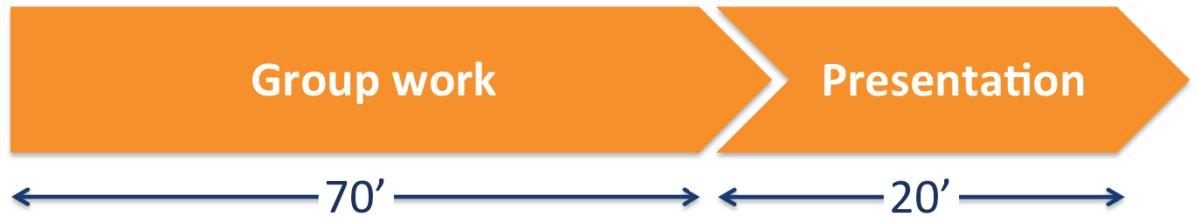
- “[Trees, maps and theorems](#)”, J.L. Doumont
- “[Rédiger des textes techniques et scientifiques en français et en anglais](#)”, G. Barbottin
- [Nature Education](#)
- [ULg Institut Supérieur des Langues Vivantes](#)
- [The Purdue Online Writing Lab \(OWL\)](#)
- ... and many more!

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- J.L. Doumont, *Trees, maps and theorems – Effective communication for rational minds*, Principiae (Belgium), ISBN 978 9081367707, 2009.
- G. Barbottin, *Rédiger des textes techniques et scientifiques en français et en anglais*, INSEP CONSULTING, ISBN 978 2914006194, 2003.
- Nature Education: <http://www.nature.com/scitable/ebooks/english-communication-for-scientists-14053993/contents> (25/09/2016).
- ISLV: http://www.ulg.ac.be/cms/c_2078026/en/ (25/09/2016).
- OWL: <https://owl.english.purdue.edu> (25/09/2016).

Case studies

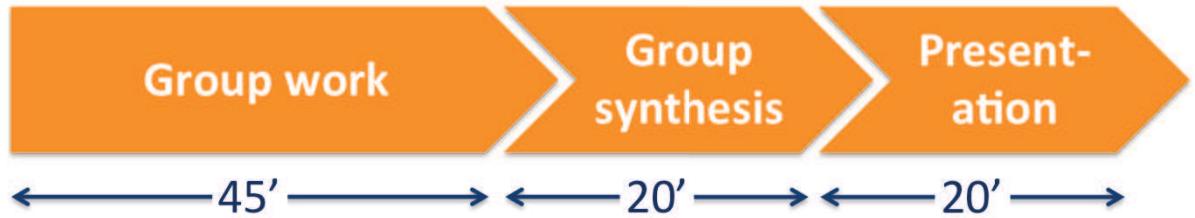
How we will proceed



Group	Case study
1	Data plotting
2	
3	Abstract writing
4	
5	Presentation slide
6	

All

How we will proceed



Group	Case study	Discussion
1 2	Data plotting	Groups 1 + 2
3 4	Abstract writing	Groups 3 + 4
5 6	Presentation slide	Groups 5 + 6
		All