Visualizing and Presenting in Research and Teaching
How to read and understand scientific texts

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Course Goals

- How to prepare scientific content for a presentation

- How to prepare a presentation

- What are the tools for visualization and how to use them

- How to layout slides

- How to prepare slides with PowerPoint and LaTeX

Some Warm-up Questions

- Did you already give a talk?

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- What are your experiences?

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- What are your experiences?

- What tools did you use?

- What tools are there in principle?

- How did you prepare?

First Step towards a Presentation: Your Topic

- Assumption: You will have to present a given text.

- Question: How to work through this text?

- What does it mean to read, try to understand?

    - Having the relevant background knowledge

    - Being interested and curious

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Five Strategies towards Understanding

- Metacognition

- Syntactico-semantic analysis

- Reduction

- Reconstruction

- Elaboration

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Metacognition

Reflexion about one's own mental actions:

- Questions to oneself:
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  - What do I want do learn? (formulate concrete questions that can guide you through the reading process)
  - Do I need help (dictionaries etc.)?

- Questions to the text:
  - What kind of text is it?
  - What can I expect?
  - What is the aspiration level?
  - What kind of (domain-specific) language?

- What are my strategies to explore the content of the text? (order of reading, how to write anything down)

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- Technical term or every-day language?

- Consult Wikipedia and domain-specific dictionaries/encyclopediae

- Example: "motivation"

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Reduce text on its most important information:

1. **Underline**
2. Notes in the margin (structure of content vs. structure of reasoning)
   - Structure of content: consider each paragraph and write down a keyword → "external memory"
   - Structure of reasoning: What is the line of argument (statement, reason, example, conclusion)?
   - Best: combination of these two!
3. **Excerpting**
   - Excerpt
   - Condense

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      2. General or specific excerpt
      3. General: What is the topic of the paragraph? What does it say about it?
   2. Condense
      1. Summarize the summaries
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Reconstruct

Visualize a text

- Concept mapping vs.

- Mind maps

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Elaborate

- Elaborate: "produce something on your own"

- No longer reader but reviewer

- Criteria: form and content

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Scientific Best-Practice

- What is the underlying question? Is it relevant?

- What methods are used? Are they appropriate?

- What are the premises of the author?

- Is the line of resoning conclusive?

- Did the author mention the relevant literature?

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- What kind of results does the author look for?

- Why is the author interested in this topic?

- Who is the initiator? (author herself or third party)

- What is the author's perspective (politic, religious,...)?

- Is her ideologic position transparent?

- Are there any preferred values?

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Claim of Validity

Category	Example	Questions
about reality	"The full-time school helps to increase social competence."	How? Is that true? Evidence?
about values	"Freedom is the most important good of humanity"	What does it mean? Objections? Is this desirable for everyone? Is this realizable?
about means	"You should buy Hedge funds to minimize the risks of investment."	What can/must be done? Premises? Objections? Counterevidence?

Types of Argumentation

Type	Strategy/Source	Counterarguments
facts	evidence, statistics, hard data	counterevidence, conflictive data
experience	case examples	oppositional experience
values, rules	Source of information that is accepted as authority	criticize source
authority	People whose influence is acknowledged because of their position/competence	not accept authorities cite oppositional points of view

Language

What the author writes:	What the author means:
As it is known...	I think...
It is clear that...	I think...
Maybe...	I don't know exactly...
There is general agreement on...	Some people think that...
For obvious reasons...	I don't have any evidence
There is no doubt...	In my opinion...
It is probable that...	I don't have enough evidence
It is not necessary to go into...	I don't want to go into...
always, ever	often, usually
every, nothing	most, few
totally, absolutely	quite, more or less