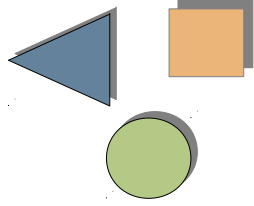# 12. Different Reports in the Bachelor/Masters Process

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http://st.inf.tu-dresden.de/acse

1) Different Types of Reports

2) Outlining

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Literature

▲ Karl-Dieter Bünting, Axel Bitterlich, Ulrike Pospiech. „Schreiben im Studium – Ein Trainingsprogramm". Cornelsen Verlag. 1. Auflage: 1996, 5. Auflage: 2000

▲ etwas weniger Material, nicht so gut gelungen:
  – Axel Bitterlich, Ulrike Pospiech. „Schreiben im Studium: mit Erfolg – Ein Leitfaden". 1.Auflage: 2000, 5.Auflage: 2005

▲ Umberto Eco, Walter Schick. Wie man eine wissenschaftliche Abschlußarbeit schreibt. In Doktor-, Diplom- und Magisterarbeit in den Geistes- und Sozialwissenschaften (2007). utb-Verlag.

▲ B. Demuth, H. Hussmann. Hinweise zur Anfertigung wissenschaftlicher Arbeiten. Lehrstuhl Softwaretechnologie, TU Dresden. http://st.inf.tu-dresden.de/home/download/pdf/SWTHinweise.pdf

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12.1. Different Types of Reports

- The Meeting Protocol

- The Bachelor/Master/PhD thesis

- The Research Paper
- The Research Dossier

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Writing Scientific Reports

- According to Umberto Eco, all scientific reports must contain 4 components:

- **Object:** The investigation treats a clear, consice, and demarcable concept, idea, or object.

  – Die Untersuchung behandelt einen erkennbaren Gegenstand.

- **Novelty:** The investigation must find out and report *new things, results or contributions,* showing the object from a new point of view

- **Relevance:** The investigation must be useful for other people.

- **Validability:** The investigation's results must be reproducable, i.e., the validation of the investigation must be repeatable (empirical or experimental or deductive).

[Umberto Eco]

1	Object?	2	Novelty?
4	Validability?	3	Relevance?

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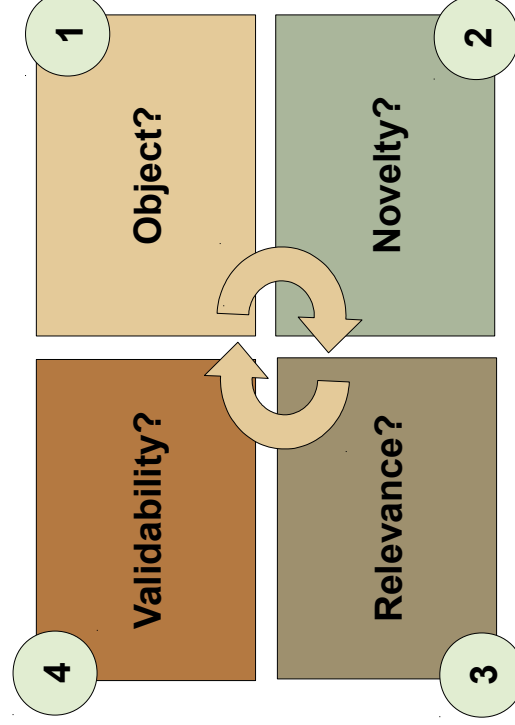
Bachelor Thesis (Belegarbeit) and Master's Thesis (Abschlussarbeit, Diplomarbeit)

▲ Proof showing that you can work in a scientific way
  – Literature analysis, research results, process..
▲ Written report for the academic degree
▲ How to find the topic:
  – Yourself: Advantages and Disadvantages; usually looses some time (only for Master's)
  – From the research group: faster
  – From industry; requirements should be scientific, i.e., a research problem of technical science should exist
▲ Documents along the way to Master's thesis:
  – Research Exposé
  – Contributions to the research dossier of the group:
    • 1-page research summary
    • 1-page technology demonstrator description
   • Poster
  – Semi-defense
  – Report
  – Final defense
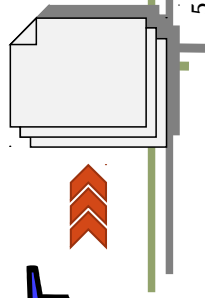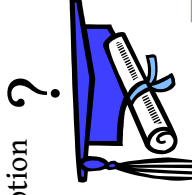
The Excerpt of a Text (Exzerpt)

▲ Excerpt every paper you read. Excerpting the literature you read is for memoization and reciting (see chapter "Reading")
  – Without excerpt no report, time for reading is lost
▲ Write down questions you have
▲ Try to formulate the main thoughts of a text
▲ Try to write a summary
  – or a mind map
▲ On paper
▲ On file cards
▲ On "everynote" on the web

Writing a Bullet Protocol of a Lecture or Meeting (Verlaufsprotokoll)

- Protocol header:
  - Motivation, Location, Time
  - Topic (fill in later)
- Write in keywords/catchwords/bullet minutes
- Use stenographia
- Use arrows to connect different concepts
- Leave a little space to add comments later
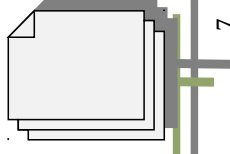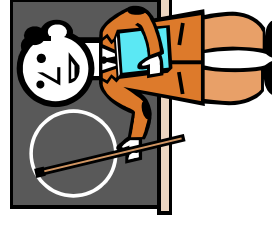
Meeting Result Protocols and Supervisor Meetings

- No meeting without a **result protocol**; a meeting without without a protocol is a waste of time
- Public, complete record of results
- Protocol must be acknowledged of the group at the next meeting
  - omissions should be corrected
- Shows the advance of the group process
- **Protocol blog:** Meeting protocols can be written as a *wiki or blog*

Supervisor meetings for **PhD, Masters and Bachelor students:**
- Regular meeting with control of process and objectives
- Write up results, decisions, rationales, otherwise you forget and loose time
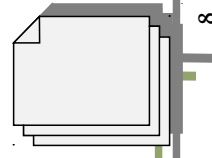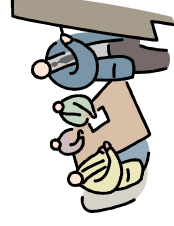
Form of Result Protocol (Ergebnisprotokoll)

▲ Protocol header:
- Motivation, Location, Time
- Participants
- Chair of meeting
- Protocolant

▲ Topic
▲ Agenda (Tagesordnung)
▲ Results and decisions according to agenda
▲ (Signature of protocolant and meeting chair)
▲ Appendices

What is a Research Proposal (Exposé, Forschungsproposal)?

▲ At the beginning of her work, every student should write an exposé (research proposal) of 2-10 pages
- Plans and prepares a Bachelor/Master/PhD thesis

▲ Length limit for Bachelor: 2 pages; Masters: 3 pages; PhD: 8 pages

▲ The exposé answers the following questions:
- What is the profile of the thesis (technical research, literature analysis, empirical, etc.)
- What is the research problem?
- What is the research question?
- What is the relevance?
  - For practical and idealistic research? (see chapter "Science")
  - For basic research, technology research, applied research?
- What is the topic of work?
- What is the research result (novelty, contribution)?
- What is the research method?
- What is the validation?

▲ Shows also:
- Administration (Name, Semester, Program, etc.)
- Own previous work
- Preliminary table of contents
- Roadmap and milestones (net plan, Gantt chart)
- Discussion of already reviewed literature
- Important references
- Important concepts from the literature (glossary)
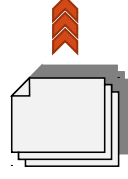
[Stickel-Wolf/Wolf]

Exposé-Defense

- ▲ At the beginning of your process, allocate a "exposé-defense" in the group's seminar
- ▲ The Exposé-defense must present the exposé of your work in 5 slides
- ▲ Time: 10 min Talk + 15 min Discussion
- ▲ Purpose: Present your research plan (see slide on "exposé")

Semi-Defenses

- ▲ At the middle of your process, allocate a "semi-defense" in the group's seminar
- ▲ Time of Semi-Defense (ZB) für GrosserBeleg/Master's/DiplomArbeit/ BachelorArbeit: 20 min Talk + 25 min Discussion
- ▲ Purpose: Present your status
  - – Present your key technology
  - – Give overview on state of the art
  - – Give your supervisor and the group the chance to comment, to add experience, to help you, to correct wrong ways, to avoid dead ends
- ▲ Include
  - – Examples of your technology
  - – A slide on your progress status with percentages of completion:
    - • of the requirements analysis
    - • of the literature analysis
    - • of the implementation
    - • of the report

How to Grade a Bachelor/Master's Thesis (Example of ST Group)

Bewertung der schriftlichen Arbeit -- Erstgutachter

Kriterium	Gewicht	Note	Gesamt	Begründung	
1 Fachliche Qualität (Technical Quality)					
1a. Erfüllung der Aufgabenstellung	3		0,00		
1b. Technische Fehlerfreiheit	3		0,00		
1c. Originalität, eigener Beitrag	3		0,00		
1d. Selbständig erworbenes Fachwissen	2		0,00		
1e. Einbeziehung relevanter Literatur	1		0,00		Teilnote 1:
2 Qualität der Darstellung (Quality of Presentation)					
2a. Klarheit	2		0,00		
2b. Aufgabendefinition, Einleitung	2		0,00		
2c. Gliederung, Argumentation	2		0,00		
2d. Schlussbewertung, Folgerungen	1		0,00		
2e. Erscheinungsbild	1		0,00		Teilnote 2:
3 Prozess (Process)					
3a. Zeitplanung	2		0,00		
3b. Selbständigkeit	2		0,00		
3c. Eigenmotivation	3		0,00		
3d. Berücksichtigung von Vorschlägen	3		0,00		

Defense Talks and Disputationes

▲ Around the time of delivering the report, allocate a "defense" in the group's seminar

▲ Time of Defense for GrosserBeleg/BachelorArbeit: 20 min talk + 15 min discussion
  – for Master's/DiplomArbeit/ : 30 min talk + 15 min discussion

▲ Purpose: Present your results
  – Present your key technology
  – Present your scientific progress

▲ Include
  – Examples of your technology
  – A demo of the technology demonstrator (include this in talk time)

▲ A defense is a *disputatio, i.e,* it is allowed to interrupt your talk at any time and ask questions or refute your arguments.
 – Expect discussions!
  – http://en.wikipedia.org/wiki/Disputation

The Nature of a Disputation

▲ While a *talk* should not easily be interrupted, a disputation *must be* interrupted at any time when a point is disputed and should be discussed.

▲ Be aware: your professor or opponent can interrupt you any time and ask nasty question.

▲ Train this!

12.2. Outlining for All Kinds of Reports
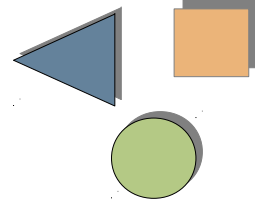
General Issues about Reports

- ▲ Abstract vs. Introduction
- ▲ Summary vs. Conclusion
- ▲ Section vs. Paragraph
- ▲ Margin notes, footnotes, endnotes
- ▲ Tables
  - Tables of Contents
  - Figures
  - Index
  - Bibliography (Table of references)
  - Glossary

Headlines

- ▲ A headline should introduce:
  - the topic or theme
  - the novelty or scientific contribution
  - the benefit to the reader
- ▲ It should be a *controller with a controlling idea* (see later)

Action-oriented
(Handlungsorientiert)
- Schreiben im Studium
- Wissenschaftlich arbeiten
- How to outline an excellent text
- How do I write a readable text?

topic? novelty?
benefit? contribution?

Concept-oriented
(Begriffsorientiert)
- Die Textsorten
- The Protocol and Your Patience
- Das Exposé
- The writer and her mood

topic? novelty?
benefit? contribution?

Avoid Too General Headlines

▲ Don't structure a text or talk with only "generic" possible headlines, such as

1) Introduction
2) Background
3) State of the Art
4) Conceptualization
5) Optimization
6) Evaluation
7) Conclusion

▲ Use standard" titles only for Introduction, Background, State of the Art, Conclusion, NOT for your chapters with your own work.

▲ Much better will be:

1) The World Needs Natural Energy
2) What Natural Energy is About
3) Natural Energy Today
4) Water Pumping Plants as a New Concept for Natural Energy Storage
5) Optimized Pumping
6) Why Pumping is Better than Oil Pumping
7) Conclusion

▲ This is in deed a possible standard outline, but it is boring.

Write a headline as a controlling idea (see later)


Forms of Outlines

Paragraphic Outline

I. **Die Schrift (§ 1)**
II. **Die Zeichen (§§ 2-37)**
　　A. Vokale (§§ 2-6)
　　B. Konsonanten (§§ 7-25)
　　C. Ziffern (§§ 26-36)
　　D. Sonderzeichen (§ 37)
III. **Der Satz (§§ 38-51)**
　　A. Hauptsatz (§§ 38-42)
　　...

Alpha-numeric Outline

I.
　1.
　　a)
　　b)
　　　α)
　　　β)
　2.
II.
...

Parts

Einleitung
Teil A
1.
1.1
1.2
2
Teil B
(...)
Schluss

Hierarchy

1.
2.
2.1
2.1.1
2.1.2
2.2
2.3
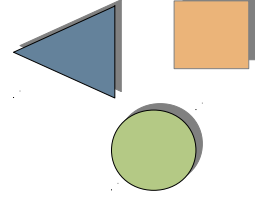**3.**
...

Paragraphs and Headlines

Law of Paragraph Headline:
Never write a paragraph without invisible headline.

Law of Paragraph Question:
Never write a paragraph without invisible question you answer in the paragraph.
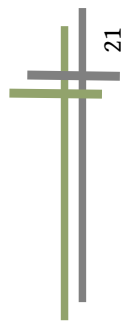
12.3 Literature Analysis Chapters

Background vs Related Work

▲ "Background" chapter: A chapter discussing literature with definitions, results, theorems *necessary to understand your work, your thesis, and your results*

- usually at the front, e.g., Chapter 2 or 3

▲ "Related Work" chapter: A chapter for discussing literature with *results related to your work*

- highlighting differences
- highlighting different frame conditions
- highlighing the limits of other approaches
- usually at the end, e.g., Chapter 7, or at the end of each chapter
- Sometimes, "Related Work" can also be a chapter after the "Background" chapter, e.g., Chapter 3

Analyzing Overview Papers (Homework)

▲ An **overview paper** is a paper analyzing the state of the art in a field, or the literature. Every thesis has to have at least one overview chapter, similar in structure.

▲ To prepare, we should analyze several overview papers:

- Steve Vinoski. An overview of middleware. In Albert Llamosí and Alfred Strohmeier, editors, Reliable Software Technologies - Ada-Europe 2004, volume 3063 of Lecture Notes in Computer Science, pages 35-51. Springer. Berlin / Heidelberg, 2004. 10.1007/978-3-540-24841-5_3.

- Tim Sheard. Accomplishments and research challenges in meta-programming. In Walid Taha, editor, Semantics, Applications, and Implementation of Program Generation, volume 2196 of Lecture Notes in Computer Science, pages 2-44. Springer Berlin / Heidelberg, 2001. 10.1007/3-540-44806-3_2.

- Mazeiar Salehie and Ladan Tahvildari. Self-adaptive software: Landscape and research challenges. ACM Trans. Auton. Adapt. Syst., 4(2):14:1-14:42, May 2009.

▲ Questions to answer:

- Find the papers on the web
- Compare their table of contents
- Can you find a pattern for a structure of an overview paper?
- Read the paper with the most important structure with the RIK process
- Decide on a structure for your paper in your group.

The End

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