Research Methodology and Scientific Writing, 2011, II2202

Scientific Writing II

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Presentation – Graphs

Illustrate and reveal data:

- Make the viewer focuses on substance
- Avoid distorting the data
- Present many numbers in a small area
- Make large data sets connective

- Use explanatory text under Figure / Table
- Explain the Figure / Table in the text

Source: Rebecca Hincks Language and Communication, KTH
Presentation – Graphs

A graph should:

☐ Encourage to compare different pieces of data

☐ Reveal the data at several detail levels

☐ Have a clear purpose

☐ If possible: Integrate statistical and written descriptions
Presentation – Graphs

- *Line graphs* for showing changes over time
- *Bar graphs* for illustrating populations
- *Pie charts* for illustrating parts of a whole data set
- *Scatter plots* reveal outliers and patterns
- *Tables* can present smaller number sets and text

-> Use the right graph for the right data

Source: Rebecca Hincks Language and Communication, KTH
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Writing Report / Thesis

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Report /Thesis

Why write reports and theses?
Report /Thesis

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-> Get readers to read it!
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How get readers to find your reports and theses?
Report /Thesis

Why write reports and theses?

-> Get readers to read it!

How get readers to find your reports and theses?

-> Interest and attract the readers
Guide the reader through the text – the “red thread”

- Readers interpret the text where it is located

- Highlight and emphases various pieces of information:
  - Depend on degree of importance
Titles

- Aim to attract the readers
- State the main topic of the study
- Separate your thesis from other theses in the field
- A clear and complete but succinct (powerful)
Abstract

- Capture the readers - Attract a wide range
- Write for non-specialists
- Summarise the contents of the report / thesis.
  - One – two sentences about the background
  - Purpose
  - The study
  - Results
  - Conclusions

- “Stand by its own” – concise, informative and complete
Abstract

- Important findings in few words - about ½ A4-page

- Avoid:
  - Abbreviations
  - Unfamiliar terms
  - Citations

- Do not include:
  - References
Keywords

Why use keywords? - To find the thesis

Choose keywords that:
- Reflect the contents
- Select important and specific terms – do not promise too much
- Avoid using the same words as in the title
- Avoid general single words that apply to a large number of papers
Introduction

- Interest your audience

- Provides sufficient context:
  - understand the study independently of previous publications on the topic.
  - lead to the work

- Gives an overview of what to expect in the paper

- A clear “funnel”:
  - start broadly -> narrow to a question
Background

- From general background to specific background of the subject
- Previous research and work in the area
- Discuss current beliefs
  - But exhaustive literature review in a chapter
- References to others
- Use past tense and present tense
Problem / Problem statement

- Direct focus on the problem / phenomenon
- Describe problems of previous work and/or unknown factors in the area

- *Current problem situation*
  - The causes
  - The effects

- State the central point
- Usually ends with a question
Hypothesis

✓ A proposed explanations for observable phenomena

✓ Is a belief - Must be clear and concise

✓ Must be measurable

✓ Must follow from the problem statement

-> Not always needed
Purpose

- For the thesis

- Difference between:
  "purpose with the thesis" – "purpose with the work"

- Most important element – central point

- Logically follow from previous statements
Purpose for the thesis

- Readers know what to expect in the thesis (read in direct way)
- Every paragraph and sentence relate to the purpose
- May allow the purpose of the work
Method for the thesis

- In Introduction: -> For writing the thesis
- Working process
- Commonly - literature studies
- Introduction of the study
Delimitations

✓ Everything that could be included in the thesis

✓ Choice for exclusion

✓ Arguments for selection
  - Not time!
Disposition

✓ “Reading schedule” for the reader
✓ Write as text – not bulleted lists
✓ For every chapter

- what is the contribution?
Good Cohesion and Coherence

✓ Sentence locations
✓ Topic sentences
✓ Word locations
✓ Key terms
✓ Transitions – between paragraphs, sections, chapters
Common problems

✓ Missing elements (problems, question, introduction to experimental approach/study)

✓ Obscure elements /Unclear descriptions – confuse the readers

✓ Excessive length – often several topics

✓ Context/Background is too narrow
Chapter/Section 2

- Commonly the theory part

  - Detailed description about the subject
  
  - Present and describe relevant theories regarding the topic
  
  - Use references!
Chapter/Section 3

Can be – Method & Methodology

- Detailed description about the research method, and methodology
  - Sufficient to evaluate and repeat the work
  - Use references

- Presents and explains the method in order to fulfill the purpose of this thesis

- If poor, wrong or incomplete:
  -> the study is not trusted
The chapter should (could) include:

- Philosophical assumption(s)
- Research Method(s)
- Research Approach(es)
- Research Design(s)
Chapter/Section 4

- Follows the method part – The study
  - Includes detailed description about the study but not results
    - Material used for the study (media, apparatus)
    - Subjects (patients, experimental materials)
    - Number asked, Number participated, Selected, Relevant details (gender, age, knowledge)
    - Dependent / Independent variables
The Study

- Procedures (what, how, why you did something)
- If a lot of details (and long chapter):
  - Place the significant parts in the chapter
  - Place less and detailed parts in Appendix
    - Detailed descriptions of procedures
    - Other “lengthly” descriptions
    - Data sets, Tables, Algorithms, Proofs
    - Transcriptions
  - Arrange in chronologic order
  - Link the different topics
  - Not forward referencing except to Appendix
The Study

- Literature study as data collection:
  - Only if the collected pages are for data analysis (not background data) – making analysis on the text
Common problems

- Insufficient details
- Lack of arguments or Invalid arguments
- Unjustifiable switching between passive and active voice
- Unjustifiable switching between past tense and active voice
Chapter/Section 5

- Follows the study part – Analysis
  - Present analysis of the data
  - Data from the experiments
  - Coding / Interpretation
  - Correlations between data
  - Examples:
    “the heart rate increased with”, “The terminals were used 90% of a day”, “It is 67% women and 20% men”
Follows the analysis part
- Results and Discussions of the study

- Report main findings and other important findings
- Present only the relevant results
  - Reflect the information presented in the method section
- Point the reader to the data shown in figures and tables
Chapter/Section 6

- Additional supportive evidence
- Important findings
- Present and discuss alternative measurements
- Interpret the data for the reader
  - The meaning of the data
Chapter/Section 6

- Quality assurance of the study:
  - Validation
  - Replication
  - Reliability
  - Dependability
  - Transferability
  - Confirmability
Chapter/Section 7 - Conclusions

Conclusions:

- Present only the relevant thesis results
  - Reflect information presented in the introduction
  - Hypothesis – falsify or verify
  - Explain contradictions
- Additional results meaningful to the thesis
Chapter/Section 7 - Conclusions

- Present results that confirm or falsify:
  - Purpose of the thesis
  - Goal
  - Problem statement of the thesis
  - Experimental approach
  - Result of the whole study

- Emphasize and signal your results

- Tell what you think about your results and how strongly you believe in them.
Chapter/Section 7 - Conclusions

- **Discussion** (report/thesis – not result of the study)
  - Interpret your key findings.
  - Reflect on – *and argue*:
    - Purpose of the thesis
    - Limitations
    - Hypothesis
    - Problem statement of the thesis
    - Interpret the results of the study, summarize and generalize
    - Other authors’ work (Background)
  - Keep in mind who your potential readers will be
Chapter/Section 7 - Conclusions

- From key findings to closure

1. Interpret key findings / Answer problem statement

2. Compare/ Contrast to previous studies, Limitations of the study, Unexpected findings, Hypothesis

3. Summary, Significance/Implications for your field and society
Chapter/Section 7 - Conclusions

- **Further work** - Look to the future
  - What will be the next step for the study
    - For anyone to work with
  - What will be the next step for the thesis
Chapter/Section 7 - Conclusions

Common problems:

- Missing components (Results that reflect purpose, goal, hypothesis, background, experiment)
- Excessive experimental details
- Inclusion of irrelevant or peripheral information
- Inclusion of speculations and conclusions beyond interpretation of results
References

- Provide original references
- Correctly place the reference
  - Which is correct?

The inductive reasoning [3] will be used as the main scientific methodology for this thesis.

The inductive reasoning will be used as the main scientific methodology for this thesis [3].
References

- Which is correct?

According to [3],

According to Hofmann [3],
References


Questions?