



Aalto University  
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# Scientific writing

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# IMRAD structure

The **introduction** was concentrating on reviewing previous studies related to the topic but also explained briefly the current experiment, hypothesis and the goal in the very end of it. When I read the **Methods** chapter I realized how important and demanding it is to explain the research procedure in a *systematic, highly detailed and clear* way at the same time. I also found out, that *pictures, tables and graphs are very effective* when going through the used methods. It was also surprising to learn that the **Results** chapter only described the results very briefly and that the whole *interpretation of the results* was presented in the **Discussion** chapter.

# IMRAD structure

Full IMRAD	75 %
Mostly/somewhat/loosely IMRAD	12.5 %
Non-IMRAD	12.5 %

*“So we could say that the report somehow follows the structure proposed by IMRAD, although it incorporates or plays a little with the scope of each part.”*

*“However, it was hard to distinguish where the methods ended and results started.”*

*“...IMRMRMRD...”*

*“...”related work” as chapter two.”*

*“ ... I have used similar style when writing scientific papers but never knew about this method”*

# Useful?

- **Yes 66%**
- **Somewhat Yes 10%**

# Questions?

- What other structures than IMRAD could be possible, how they could possibly be better than the IMRAD.
- My only doubt about scientific writing is to know whether structuring the writing methodologically could pigeonhole some scientists and stop their talent or if it would really help them to organize their research work.
- How much detail one should go in the headings and, after being made aware of the IMRAD structure of papers, how closely one should adhere to it.

# Questions?

- For the writing of body text, does the rules of scientific writing differ from technical writing?
- How accurate the language has to be in order to have a credible scientific text.
- The article maybe got me to think about in general what details makes a scientific article or other text appear good and what makes it appear little less well written.
- Because of the fact that this paper is a review paper how does the journal validate if there is actually something original?

# Questions?

- How can I enhance scientific writing Skills? If my article is rejected by a journal because of lack of respected writing rules (as following of IMRAD structure), is it possible to modify the article, submitting it again afterwards? Are there any tips in order to write a complete and perfect reference section/bibliography? Does the IMRAD structure refer to English language only? Or can be an article be recognised as valid even if written in another language?
- What is the best place online to find freely accessible scientific articles besides a normal Google-search?

# Questions?

- How important is it to be discussed about theories related to the topic in scientific writing because, in my understanding, scientific papers like journals typically do not include theories?
- Reference style does not support checking the referenced text because the style does not include page number. Why is that?
- Why are we taking this up in a project course?



# Approach?

## Development of *something* for *something*

- Development case
- Method, procedure
- Proof of concept
- Validation

May feel challenging to make it look “scientific”

## The effect of *something* on *something*

- Selection of input/output parameters
- Straightforward experimental research

Your device is “just” a piece of methods

# Introduction

Day:

- Sufficient background information
  - Rationale for the present study
  - Briefly and clearly your purpose in writing the paper
1. Nature and scope of the problem investigated
  2. Brief review of the pertinent literature to orient the reader
  3. Method of investigation (with reasons)
  4. *Principal results of the investigation*
  5. *Principal conclusions suggested by the results*
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# Introduction

**How this solution differs from existing/commercial solutions?**

**What is missing from previous studies?**

**What is the current status in this field?**

**What are the methods used in this field?**

**What is the theory behind your study?**

**Requirements for the design?**

**Who would use your results and why?**

**What you can learn from previous studies?**

~~**Don't talk about the school project – this is a research project!**~~

# Different approaches to Topic

1. Development of printing quality of SLS 3D printer
2. Optimization of internal heating system for SLS 3D printer
3. Use of marking laser in automatic SLS 3D printing

**Adaptive Selective Laser Sintering Testing Device for Process Research in 3D Printing**

**Influence of Printing Orientation on Tensile Strength of SLS 3D Printed Polymer Parts**

# Different approaches to Topic

1. **Continuous Mixing of Concrete for 3D Printing**
2. **Influence of Blade Parameters on Continuous Mixing of Concrete for 3D Printing**
3. **Effectiveness of Screw Pump for Pumping Concrete Constituents to Continuous Mixer for 3D Printing**