

Article writing in chemistry and chemical engineering -Journal Club

Mikko Hupa & Dmitry Murzin & Tapio Salmi

Background

Publishing often “bottleneck” in engineering sciences, but a ‘must’ nowadays

- often project work, tight schedule, no extra reporting
- project reports seldom publishable as such
- industrial collaboration and patenting “disturbs”
- engineers not always “natural writers”
- language problems

Background

- Producing papers not often "tought", just learnt by doing - often excuses are used:
 - We already wrote the project report, why publish more?
 - My project is confidential, how could I publish it?
 - My work and results do not "fit" into a typical published paper format!
 - I have too much results, how to cut?
 - How to start writing?
 - We are many authors - who writes what?

Background

- Main focus in the overall process of producing publishable papers...
- ...not in linguistic issues
- Based on the experience when helping PhD students at Åbo Akademi writing their first papers, and, when reviewing manuscripts to journals.

For scientific writing in English...

...many excellent books and guides are available

Dr. Cathleen Ahonen's guide is tailor-made for chemical engineers and can be found at:

<http://www.ndc.fi/guide/>

Click on "guide2003.doc"

For scientific writing in English...

...a new book has been purchased:

Marin S. Robinson, Fredricka L. Stoller:

'Write like a Chemist'

Oxford University Press 2008

- Around 700 pages !
- Considers scientific articles, posters and research proposals

This course hopefully helps you

- to identify the critical steps in the process of publishing papers from your research
- to get your first papers more easily produced and published
- to learn to read scientific literature more critically and faster
- to make publishing a continuous and natural part of your research work

Issues to be discussed

1. Why to write publications - To be or not to be?
2. Where to publish - Types of publications
3. What to include - "Publishable unit, PU"
4. With whom - Question of authorship
5. How to write - Structure of the paper
6. How to get it published - Rebuttals to reviewers

Why to write publications?

- Only by international publications you become part of the development of scientific knowledge
- Engineering research absolutely needs scientific publications and not just patents, reports etc.
- Any new findings not published internationally will be made again - until they are finally published by someone
- What is not published, does not exist for the scientific community

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Types of Publications (1)

Theses

Project reports, annual updates

Conference papers, proceeding books

International journals

Non-refereed journals

Popular articles

Types of Publications (2)

Project reports, annual updates

- summarizes recent work
- essential in collaborative projects with industry
- often local language
- limited access
- no "real publication", cannot be cited
- no long-term value!
- should in any case be written in a scientific way, preferably following the structure of an article.
- all technical details should be carefully documented

Types of Publications (3)

Conference papers, proceeding books

- rapid feedback to ongoing work
- easily accepted (review of abstracts only)
- no review of the full paper
- no “real publication”, no scientific value
- should be submitted to a peer review journal

Types of Publications (4)

International journals with referee system

- papers reviewed by unidentified referees
- quality approved by scientific community
- archived and easily accessible for colleagues
- referee comments very useful (don't give up after first rejection!)
- the only right place for new results

Types of Publications (5)

Non-refereed journals –popular articles

- for a broad audience (Kemia-Kemi, Dansk kemi, Kemivärlden, ...)
- very useful for PR (for industrial people, teachers, decision makers, public image)
- no real scientific contribution
- not always accessible to colleagues in science
- not suitable for publishing new results for the first time!

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Publishable Unit

- Projects often bring plenty of results.
- Many journals prefer short, focused papers
- Project reports seldom suitable
- Learn to think in terms of "Publishable Units"
- Plan PU's already in your project plan
- Be flexible to new ideas of PU's

Publishable Unit (2)

- Novel measuring systems may be good PU's
- One good measurement campaign gives material for several PU's (Part 1, 2 etc.)
- Combining new results with previous may make a nice new PU

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Authorship Question

Important issue, may easily cause problems.

Paper: the final "product" of research work.

Should you include anyone who:

- writes or revises parts of the paper?
- contributes substantially to the work?
- can take responsibility for a part of the paper?
- can defend the entire paper?
- is a good friend/loyal colleague?

Authorship: Order of Names

- Student, others (incl. coach), supervisor, or:
 - Supervisor, others, student
 - Main author, others, most responsible author
- > PhD Student, MSc Student, Coach, Supervisor

Main author writes first draft!

Authorship Question

- Don't be shy, agree at an early stage (and stick to the agreement!)
- Be active, initiate collaborative papers. Fun!

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Structuring the Paper

- Title
- Abstract
- Introduction
- Experimental section
- Results
- Discussions
- Conclusions/ Implications
- Acknowledgments

Title

- Very important - defines focus of the paper
 - Will be the key for any literature searching
 - Should be thoroughly discussed by all authors
-
- Specific vs. short
 - Depends on the journal

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Abstract: Indicative vs. informative

Indicative abstract only indicates the subject of the paper. Suitable for:

- review articles
- theoretical papers, and
- symposium abstracts that are due before you have begun your experiments

Abstract: Indicative vs. informative

Informative abstract describes:

- the problem or purpose of the research, or an hypothesis
- your methods
- your principal findings (results also in numbers)
- even possibly some conclusions

"Mini Paper" - understandable as such

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Introduction

- A. Give general context (Define who is the reader?)
- B. Show that you know the key literature (mention ALL references dealing with your topic!)
- C. What was missing in the literature, what made you choose your topic?
- D. End with specific "mission statement" of purpose and content: "In this paper we..."

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Experimental

- Or: Methods and materials
- Or: Theoretical Basis or Theoretical Treatment
- Write in the past tense. Never use "I" or "we".
- Straight forward?

Experimental section-checklist

- Chemicals and materials (report all of them)
- Analysis/characterisation equipment and methods (equipment, columns, detectors, sample treatment procedures, retention times)
- Experimental (e.g. reactor) equipment (reactor, pretreatment units, impellers, jackets, temperature and pressure control, data acquisition...)
- Experimental programme (temperature, concentration, pressure domain, liquid/gas volumes, mass of catalyst, flow rates, residence times)
- Experimental procedure (how the experiment was performed, report all the steps concisely)
- OBS: an outsider should be able to repeat the experiment based on the description - go through each time a checklist of this kind - things are easily forgotten

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Results

- Tables and figures, make sure you refer to all
- Good figure format (not too much per figure, just make your point)
- All results should not be reported, just enough of the relevant ones to make your point (and prove accuracy etc.)
- Just “explain” the results, do not discuss (may be difficult)
- Past tense vs. present tense

Discussion

- Results and Discussion in one chapter vs. in two?
- Present principles, relationships and generalizations shown by the results
- Compare with literature data
- Point out exceptions or lack of correlation
- Define unsettled points (don't try to "explain" everything!)
- Discuss implications of your results: do we need to refine earlier concepts, theories, practices?

Structuring the Paper

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Conclusions

- List the key findings with respect to the “mission statement” in the introduction
- Past tense vs. present tense
- Bring up technical **implications**

Structuring the Paper

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- Abstract
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Acknowledgments

- Don't forget! Check once more the list of persons you give your gratitude
- Remember all parties! Be generous!
- "Gray organizations" also consist of people, don't forget to mention (Academy of Finland, Tekes, EU)

Tell your story to the colleagues

- Tell an encouraging story, how you pushed through a paper
- Never surrender!

Homework: Analysis of Structure of Selected Papers

Total presentation time 10 min

Introduce briefly the whole subject of the paper

Give critical comments on:

- Title (specific-short)
- Abstract (indicative-informative)
- Introduction (context/purpose!)
- (Experimental/Results/Discussion just briefly)
- Conclusions (vs. purpose)
- Other aspects

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Getting it published

1. Choice of Journal
2. Submission of manuscript
3. Note of receipt
4. Referee comments and recommendation by editor:

(A) Not rejected

(B) Rejected

Getting it published (A)

1. Choice of Journal
2. Submission of manuscript
3. Note of receipt
4. Referee comments and recommendation by editor:

(A) Not rejected

(B) Rejected

A: Not rejected

5 A. Rebuttals

6 A. Final decision by editor

7 A. Final manuscript

8 A. Proof version

9 A. Galley proof

10 A. Publication

Getting it published

1. Choice of Journal
2. Submission of manuscript
3. Note of receipt
4. Referee comments and recommendation by editor:

(A) Not rejected

(B) Rejected

Getting it published (B)

1. Choice of Journal
2. Submission of manuscript
3. Note of receipt
4. Referee comments and recommendation by editor:

(A) Not rejected

(B) Rejected

B: Rejected

5 B. Take it easy

6 B. Resubmit after changes

7 B. Submit to other journal

8 B. Go to 2.

Some final remarks

1. Think about publications, articles from the first beginning
2. Perform experiments in such a manner that systematic entities are formed (e.g. determination of kinetic trends, temperature/concentration/catalyst effects)
3. Keep a very good documentation of experiments; avoid uncontrolled accumulation of experimental data
4. Take it very seriously, when the supervisor/colleague tells that now it is time to write - Power Point presentations are not an article!
5. Start the writing with the part you feel easiest (typically from the experimental part; Introduction should be written last or at least checked once more very carefully when the manuscript is ready)
6. Think carefully where to publish