Writing Scientific Journal Articles

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TUAS-building, lecture hall TU1

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1 Introduction

Why to publish

- Article is proof of good scientific research
- Scientific career
  - Competition is getting tougher
What does a scientific article consist?

- Timely, interesting research topic
  - Scientific novelty – scientific impact
    - Small increment to existing knowledge is enough
  - Practical implications (e.g. Companies, society, hostitals)

- Scientifically conducted research
  - High-quality data

- Purpose of your research is to draw publishable conclusions
  - Collecting data is NOT enough

How high is the bar?

- The number of Journals is vast and is increasing
  \(\rightarrow\) Almost any topic is publishable

- Doable with your capabilities

- Step-by-step increase in ambition level
  - Starting researcher vs. post-doc
  - High-level vs. immature research group

- Learning by doing is the only way
Criteria for evaluating publishing  
Quantity, Quality, and Impact (citations)

- **Quantity**: Must publish to be considered a researcher
- **Quality**: In which journals have you published
  - Impact factor
  - Julkaisufoorumi
  - Web of Science indexed journals
  - Journal maturity (No: of volumes)
- **Impact**: how many times your article has been cited
  - Google Scholar
  - Scopus
  - Web of science

Impact factor

- Describes the number of citations gained by the articles of a journal

  **Year 1**  **Year 2**  **Year 3**

- Impact factor for year 3: average number of citations the articles published in years 1 and 2 receive during year 3
Julkaisufoorumi (JUFO)

Finnish Publication Forum

- Level 0 = does not fulfill all criteria
- Level 1 = 80% of ranked scientific journals
- Level 2 = 20% ranked scientific journals
- Level 3 = 5% ranked scientific journals
  - Level three journals are also ranked level 2

Beall's list of predatory journals

Number of citations

- Google Scholar
  - Easiest to use
  - Widest coverage

- Scopus & Web of Science
  - More information available
  - Acknowledges scientific citations only
    - Smaller number of citations than with Scholar
Evaluating researchers

h-index

- Measures the productivity and impact of an individual researcher
- The quantity of researcher's most cited articles and the number of citations
- Harzing's *Publish or Perish*
- Scopus
- Web of science

H-index
Different publishing cultures

• High-level research group
  – Concentrates on level 2 or 3 publications
  – Strong guidance from supervisors
  – Limited number of doctoral students
  – Pre-planned learning paths

• Less developed research group
  – Publishing culture immature
  – Doctoral student’s own role emphasised

Starting researcher

• Concentrate on speeding up your learning process

• Learn from a high-level research group
  – Offer to help others

• Alternatively form a group with your colleagues
  • 1st article as soon as possible
  • Consider your ambition level (e.g. impact factor vs. probability of publication)
Journal’s turnaround time

- Favour Journals with short **turnaround**
  - Time from submission to feedback
  - Enables swift learning
  - Especially doctoral students

- Find out turnaround time
  - Printed on articles in some Journals
  - Mentioned on Journal’s webpage
  - Politely ask editor-in-chief
  - Utilise tacit knowledge

Starting points

- Research is a product – must “sell” to target audience
  - *editor*, reviewers, readers

- Research must aim towards publishing
  - **Not** research first & then think publishing

- Write article for target Journal
  - **Not** write first & then think where to send
    → Pull-based writing
Target Journal analysis

• Study Journal’s web-pages
  – Mission, what type of articles, editorial board, publisher
  – who pays the expenses i.e. Journal’s business model

• Study recently published articles
  – Authors’ origins
  – Quantitative, qualitative etc.
  – Is your topic trendy?
  – Can you and your group reach the level expected and how?

Outlining an article

• Focus
  – No need to include all results in one article

• Emphasis on one’s own findings
  – not on literature
    • unless writing a review article
  – not on the development of own understanding
Outlining an article

- What is the problem?
- Why is it important?
- How did you solve the problem?
  - Scientific credibility
- What are your observations?
- How did you end up with your conclusions?
- What are the implications of your research?
- What do you recommend for future study?

2 Article structure
Article structure

- Title
- Abstract
- Introduction & Literature review
- Research process / Materials & methods
- Results & Discussion
- Conclusions
- Cp. IMRAD

Title

- Number of words
  - e.g. max 8

- Accuracy according to target Journal
  - Precise not always best sales argument
  - Editor-in-chief prefers selling titles (more clicks)

- Avoid abbreviations
- Avoid too many and words
Abstract

- Especially important!

1. Relation to a bigger picture
2. Article’s purpose
3. Research method
4. Key results
5. Practical implications

Introduction

- Justify topic’s importance - By using references
- What is already known about the topic
- How do you aim to contribute
- Funnel
  - Narrowing focus, paragraph-by-paragraph
  - From more general to more specific
  - Research questions at the end
Theory / literature review

• Write theory to support article’s storyline
  – Describe key studies briefly, what is already known
  – Do not describe development of one’s own understanding

• Especially cite new scientific articles
  – Editor-in-chiefs want the scientific discussion on their own forum
  – Recent references ensure newness
  – 70% journal articles: 20 %; Guru’s: 10%; books/ conference articles
  – Minimise references that are not in English

About references

• 3-5 citations to your target journal
  – If difficult → wrong journal?

• Journal self-citation
• Author self-citation
Research process / materials & methods

- **Clearly** state, how the research was done
  - Equipment, mathematical models, materials etc.
- Ensures scientific credibility
  - Enables evaluating conclusions
- Visually when appropriate
- Additional evidence can be included as appendices (e.g. Interview questionnaire)

Results & Discussion

- Present essential results
  - Modellings, measurements etc.
- **Not all** the results, only the ones essential for chosen focus
- Visual elements to highlight key results
- Present analyses in discussion
  - How does your research relate to previous studies?
    - Contradicts, confirms
  - Researcher’s own contemplation
  - Why the results are as they are?
Conclusions

Highlight your contribution

One paragraph for each of the following:

• Background (aims and objectives)
• Results (RQ-by-RQ)
  – One paragraph / RQ
• Practical implications (society, companies, etc.)
• Limitations & proposals for future study

Visual elements

• Highlight central aspects by using visual elements (illustrations, tables, listings)
  – Purpose to direct reader’s/reviewer’s attention to key aspects
  – Avoid using too many → confusion

• Highlight your own work, not others’
  – Illustrations must be your own

• “Sprinkle” suitably along the article
  – Optimally form a unite whole (cp. a comic strip)
3 Writing & Publication Process

Writing order

- Initial outlining of research problem
- Initial outlining of theory
- Collecting and analysing data
- Writing results
  - Analyses & conclusions
- Research process (Materials & methods)
- Literature review
- Introduction
- Conclusions
- Abstract
- Title
- Finalising
- Iterations when required
Grouping/moving text

- Effective way to work text
  - Reduces text bouncing unnecessarily

- Group/move text based on content
  - Move sentences when required
  - E.g. when analysing practical elements
  - Funnel principle works also outside introduction
    - From more general to specific details

Reviews

- Small increments
  - Better accuracy than reviewing a whole article
  - Idea
  - Paragraph
  - Chapter

- Driving engine works first → incremental reviews in a small group

- Once the article is "ready" fresh brains to review
  - To obtain "objective" opinion & viewpoint

- Precise, critical & constructive feedback

- Reviews in front of a screen
Targeting high-level Journals

- Clear story about your contribution
  - How you add to the existing knowledge
  - Choose a conversation you aim to contribute to
- A thorough literature review to show what is already known
- Make your analytical process explicit (show, do not tell)
- Include implications for theory, practice and policy

Targeting high-level Journals

- Try to find an experienced co-author (published at levels 2-3)
  - If not in your own unit, then seek elsewhere
- Support the interests of the experienced researcher
  - You must be of benefit
  - Offer your resource capacity
  - You may be able to offer interesting data
- Option: try first a journal one step above your realistic level → feedback → different journal
Finalising

- Find out target Journal’s format requirements and follow them precisely
- References to target Journal & publisher
- CORRECT THE LANGUAGE
  - Storyline
  - Use a native to check English
- Remove cockroaches!
  - Reviewer may seek for reasons to reject
- Fresh brains to review

Journal’s decision process

- Submit finalised article
  - (on-line submission / email)
- Decision (reject / process continues)
  - Based on a relatively short check
- Review (weeks – a year)
- Reject/ Acceptance/ Conditional acceptance
- Do not get depressed if receive critique
Key aspects for acceptance

- Editor-in-chief, editor, reviewer, reader
  - Do not receive (big) compensation
- Title
- Abstract
- Introduction
- Conclusions
- Visual elements

Quick check by editor-in-chief

- In-line with Journal’s mission
- Adequate language
- Clear structure
- Visual elements
- Adequate references
- Research problem and results match
Reacting to review comments

• Do not get depressed – be analytical
  – Time to work!

• In practice, if right journal, acceptance truly possible
  – Necessary changes may be relatively small
  – Make changes systematically
  – React promptly & acknowledge all change requirements
  – Justify, if decide not to change!

• Accurate point-to-point response

Point-to-point response

1. Description of research process criticised:
   A descriptive paragraph has been added to the research process section (3.1) to clarify how the research was conducted. Also, a new figure (Figure 3) has been included.

2. Better description of the interviewed companies
   Minor revision has been made in Chapter 3 to better describe the interviewed companies. However, unfortunately as the studied companies wish to maintain a level of secrecy for business reasons, we have not been able to obtain the permission to reveal the real identities.

3. The criticised statement in the section 4 “it is logical…”
   The criticised statement has been revised.

4. Comma missing in reference Anderson 2004 on page 4
   A comma has been added to the reference (Anderson, 2004).
4 Writing in a group

Challenges of lone researcher

- Obtaining understanding via theory over-emphasized
- Blank paper
- Writing a stream of consciousness
  - Difficult for others to understand
- Text bouncing back and forth
- Too much copy-paste without a clear storyline
- Wasted effort → inefficiency
- Exchanging ideas difficult
- Supervisor’s time is limited
Writing in a group

- Benefits in each stage (idea, writing, finalising)
  - Many brains better than one
  - Storyline, language, consistency, general rationality, scientific aspects

- Effective work mode
  - Everyone must be of benefit
  - Good to recognise everyone’s strengths → "roles" → effectiveness
  - 3 = good number for effective group work

- Try different working modes
- Build win-win

If forming a group by yourself

- Depending on target Journal e.g. 4-5 max
- Author 1
  - Pole position for a doctoral student
  - Or other driving engine
- Author/s 2 & 3
  - Other active members in the group (or supervisor)
- Author/s 4-5
  - E.g. supervisor, professor
  - Academic merit
- Must have contribution to actual writing
5 Other observations

Other observations

- If your English is not excellent, pay especial attention to the storyline
  - Not covered in language checking
  - It is not a pleasure reviewing an article if both storyline & English language are poor

- One way is to write in your mother tongue first (key terms in English) → rough translation → native check
  - Person translating is forced to review simultaneously
Other observations

- Google scholar
  - Swift way to find references

- Avoid chasing terms
  - Aim to understand
  - Ask others
  - Using Google may tempt to chase terms

- Do not invent your own terms

7 Recap
Main points

- Obtaining feedback is important
  - Research group
  - Journal’s turnaround time
- Reviews
- Start from results when writing an article
- Funnel principle
- Structure of Conclusions
  - Background, Results, Implications, Limitations and Future research topics
- Point-to-point response on reviewers’ comments

Additional information

- Tips for writing scientific journal articles
- Practical tips for doctoral students
- Vinkkejä väitöskirjaprosessin nopeuttamiseen
- http://tinyurl.com/efficient-doctoral-studies