Writing influential peer reviewed papers - an editor’s perspective for young engineers

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- Why publish?
- Types of manuscript
- Checklist before writing: novelty, impact and readership
- Essential elements of a manuscript and quality check
- Ethics in publishing
- Journal selection
- Peer review process
- Concluding remarks
Why publish?

“Everything that can be invented has been invented”
Charles H. Duell, Commissioner of US patent office

Why add one more paper to the sea of knowledge?

The library of Congress,
Washington, D.C.

700,000,000 books

“Little drops of water and little grains of sand make the mighty ocean and a pleasant land” - Julia A. Carney
Purpose of writing papers in peer reviewed journals

Identify the most appropriate answer:

1. Earn M.S./Ph.D.
2. Impress others (mother/boyfriend/girlfriend/advisor/everyone)
3. Get a better paid job
4. Communicate rigorous new knowledge
5. Avoid wasteful duplication of work
6. Prevent loss of valuable knowledge
Methods of dissipating new knowledge

1. Tell your advisor
2. Write a thesis
3. Speak at a conference
4. Write a book
5. Write a report (prize winning?)
6. Write a conference paper
7. Write a peer reviewed journal paper

Researchers are judged by their journal papers
Why publish?

"The greatest ideas are (literally) worthless if you keep them to yourself" - Simon Peyton Jones

Publish what? New knowledge useful to readers in a timely manner

How?
Types of papers

Technical papers - majority of peer reviewed papers

Reviews - some journals only publish reviews - more time consuming and much more difficult to write

Perspectives - points of view on contemporary topics - current status and future directions

Letters to the editor - comments on published articles and author’s rebuttals

Editorials - introduction to a special issue of a journal on a contemporary topic; topics of interest to a particular journal
Types of papers

Writing reviews are much more difficult than technical papers.

Reviews are most useful if they establish facts that are not available in individual technical papers.

Example: results from many papers to show a trend.

From Nandan, DebRoy & Bhadeshia, Progress in Materials Science, 2008.

Much more time consuming.

Our focus => technical papers (majority of peer reviewed papers)
Checklist before writing a technical paper

The main idea: “A re-usable insight, useful to the reader”  
- Simon Peyton Jones

Prime novelty: the main idea should be new and useful, supported by a thorough search of literature

Impact of research: the findings should represent significant advancement of the field

Scope/audience: the work should be of sufficient interest to a community of scholars

Meet these requirements? => Start writing ASAP
## Typical content of a technical paper

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<th>Typical Length</th>
<th>Number of readers</th>
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<td>&lt;15 words</td>
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<tr>
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<td>Experimental procedure and materials</td>
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<td>Results and discussion</td>
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<td>References</td>
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* Many readers read these first
Title

To read or not to read? - readers often decide from the title

Guide search engines - friendly to abstracting services

Many more people read the title than the entire paper

Should not contain symbols, abbreviations, equations etc.

Short - 10 and 15 words is common, may depend on the journal
Abstract

Seen first => most important

Shows the most important features of the paper in a nutshell

Journals often prescribe word limits - 100 to 150 words not uncommon

One (occasionally two) paragraph(s) - no references

Many authors write the abstract last
Introduction

Attract attention - why is this paper worth reading?

Establish prime novelty - clearly state (a) what is important and new and (b) what is known and not known.

How is the work different from what is available in the literature?

A succinct review of recent peer reviewed literature => establish prime novelty. Relation between work undertaken and existing literature. Avoid unfocused general review.

Last para: questions/hypothesis and other important contents
Experimental procedure and materials

Provide as much details as needed to reproduce the experiments

It is the author’s responsibility to evaluate the quality and reproducibility of the data

Referee’s concerns about quality and reproducibility of the results (data without error bars) adversely impact acceptability of manuscripts
Results and discussion

Interpret and not narrate - major findings in relation to existing literature

Discuss significance of the new results explicitly

Point out limitations of findings and uncertainties and errors in the data

Relevant shortcomings of literature => fair game, as long as purposeful and professional

Discuss unexpected results
Results and discussion

Based on observations and not authority

“Women have fewer teeth than men”
- Aristotle

He never counted Mrs. Aristotle’s teeth

Opinions are not facts, certainly not new knowledge

Linus Pauling believed that many disease could be cured by vitamins!
Conclusions

High impact of conclusions: The findings should be sufficiently important to represent significant advancement of the field.

Brief and succinct

Tables, figures, data and pictures not necessary to establish the conclusions perhaps do not belong in the manuscript. They should be reviewed critically for exclusion.
Quality check before submission

• Does the body of the paper provides evidence to support each claim made in introduction (prime novelty)

• Evidence can be measurements, analysis and comparison, theory, case studies ...

• Free of mechanical defects - the figures and micrographs should be of high quality - check for missing figures and tables, inappropriate formatting

• Get comments on the manuscript from as many people as possible before submission to a journal - readers do not have to be experts

“If you have no critics you’ll likely have no success.”
- Malcolm X
Publication ethics

Compliance with the copyright law - inappropriate to republish a paper or its part.

Permission from the copyright holder is a must when previously published material is needed in a manuscript. Permissions to republish a figure are granted routinely by most publishers.

Editors and reviewers cannot use manuscripts submitted for publication except for the review process.

A manuscript cannot be submitted simultaneously to more than one journal.

Prevention of plagiarism

Editors and referees must disclose conflicts of interests.
Selection of a journal

Which journal is appropriate - scope and readership

How are the journals rated?

How is the journal rating useful to authors?

Match manuscript content $\Leftrightarrow$ journal's coverage of the field, rating & ability to promote articles

Journal dependent citations of three similar papers (different systems)

186 (mild steel)  120 (aluminum alloy)  81 (stainless steel)
### Impact factor

Average number of citations of papers published in last 2 years

Selected JCR Year: 2014

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Peer review process

Author submits manuscript

Preliminary review by the editor - may not send for peer review in many cases

Editor sends paper out for peer review

Experts review, often provide useful suggestions

Author revises manuscript

Editors accept or reject manuscripts

Most scientists regarded the new streamlined peer-review process as “quite an improvement.”
Addressing reviewers’ comments

Reviewers are recognized experts in their fields

They often suggest optional or mandatory revisions of the manuscript

The reviews are a valuable gift to improve the manuscript

After the manuscript is revised, a point by point response to the reviewers’ comments is to be submitted together with the revised manuscript
“It is impossible to live without failing at something, unless you live so cautiously that you might as well not have lived at all – in which case, you fail by default...... Failure taught me things about myself that I could have learned no other way.”

Rejection is temporary - an opportunity to improve the manuscript and publish a better paper at the end

J.K. Rowling


From: http://harvardmagazine.com/commencement/the-fringe-benefits-failure-the-importance-imagination
Summary

• Journal papers communicate new knowledge, avoid duplication of work and provide recognition to authors

• Start writing a manuscript as soon as three conditions are satisfied

• Some guidelines are helpful for assembling each component of a paper - many good papers are available on this topic + some comments here

• Follow a list of pre-submission tasks & ethical issues for the current manuscript

• Select a journal based on its scope, rating & ability to promote articles

• Collaborative peer-review marshals expertise of leading researchers to improve manuscripts and helps authors and the community
Happy publishing!

http://www.matse.psu.edu/modeling