

# To the author of the peer-reviewed manuscript or thesis

(white paper)

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## Introduction

This white paper summarizes some of the comments that I repeatedly make when reviewing conference papers and journal articles in the broad area of 'building performance'. It is based on an extensive review track record for journals such as *Advanced Engineering Informatics*, *Applied Energy*, *Building and Environment*, *Energy and Buildings*, *Automation in Construction*, the *Journal of Building Performance Simulation* and many others. These comments also apply to many dissertations and theses that pass my desk, so they will also be useful to students.

The structure of this white paper itself is as follows. It starts with opening comments about the contribution to knowledge, since the actual content is the most important part of any paper/thesis. Next comes a section about structure, since organisation of the material is important, especially for longer and more complex text. From there, the paper groups comments along the typical sections or chapters that are used in most texts: introduction, literature review, methodology, results, analysis, discussion, conclusions, and references. The paper ends with comments about presentation and responses to reviewers.

I recommend that you check these points one by one before submitting your manuscript. Some of them may become engrained over the years, but it is still worth doing a quick check whether an aspect has not fallen from your radar. At the same, don't expect your paper to be accepted before you have checked all boxes. In the end, reviewing is there to assure the quality, validity and originality of your publication. If there is an error in the work (say, you present a piece of work that presents a perpetual motion machine) it will still be rejected. This is also a fundamental issue with some rating schemes that may be used in automated reviewing systems like ConfTool or in academic marking.

Keep in mind that there are many, many books and guides on how to write a paper, article or thesis – see for instance Johnson (2011) or Heard (2016). This white paper is not intending to repeat these larger works. Use them and please see this white paper as some pointers to issues that may need further attention.

## Contribution to Knowledge

- If you want your article to be published in a peer-reviewed, archived journal, then the content is essential. You need to make a contribution to the field, which means that you provide new insights, knowledge, help to advance the state-of-the-art. To do this, it is essential that you describe the existent knowledge, identify a knowledge gap, and show how you address that knowledge gap. For a PhD-thesis this is also an absolute must.
- Keep in mind that a journal article is not the same as an engineering report from a R&D project, however solid your work may be. Don't just sing the praises of your project, but explain what you did, and why. Only that way can you explain how you contribute to knowledge.
- Be specific about what your article contributes to the knowledge base, and state this by way of a clear goal and objectives (or alternatively, a main research question and sub-questions). Make sure that you get back to these at the end of the article: in the conclusion I expect you to "close the loop" and say what you have achieved.

## Structure

- The traditional structure of a paper - with the headings: introduction, methodology, literature review, results, analysis, discussion, conclusion – helps greatly to convey a scientific study. Think

deep and long before you change that structure, and if you do, make sure that it is obvious why you deviate from the norm.

- A good paper has elements that are connected by 'red lines'. These connect the aim/objectives with the literature review, the methodology, the results, analysis, and are tied back together in discussion and conclusions. If you present a complex study it may be worthwhile to include a figure that describes how the elements fit together.

### **Content 1: Introducing Your Work**

- When introducing your work, think about who is reading your work. If you intend to publish in say *Energy and Buildings*, there is no need to start with a long section that explains the importance of building energy efficiency – those who read that journal will know. Focus on the matter at hand, the thing you have been working on, whether that is a new simulation model, a new heat pump system, a study of the impact of building occupants.
- A sense of urgency is always good to “sell” your research. Point out some problems, challenges, bottlenecks that need to be addressed, and back that up with some citations. Note that this is a good place to cite newspaper and news rather than academic work, to show that something is in the spotlight and received national/global attention.

### **Content 2: Literature Review**

- The description of the knowledge gap requires that you explain what others have done before – through citation of their work. This allows you to connect to previous work and make your contribution. There are very few cases where there is no previous work to cite. Expand the overview of the field by delving deeper into previous and related work in your literature or state-of-the-art. For a journal article, I roughly expect something like 20 to 30 references if it is a research article. If the paper is a review article, then my expectation is at least three times that number.
- Make sure your citations are specific. Unless you need to demonstrate a general view or understanding, try to prevent 'lump-sum references' that look like [1, 2, 3, 4, 5].
- Carefully read the work you cite, and make sure that you understand what the authors are saying. Too many citations I see are overly generic and do not seem to have properly engaged with the text that is being referenced.
- Ensure you do some critical thinking about the material you find. Just because a number of people repeat each other and thereby create a number of citations does not necessarily mean that the thing they all repeat is true. To find out you need to check whether they just cite opinions, or whether they are citing facts and evidence.

### **Content 3: Methodology**

- A good methodology describes what you have done, in way that somebody else may try to reproduce your work. This is a challenge in much of the built environment research – but please make an effort towards enabling reproducibility.
- Not only explain what you have done, but also tell the reader why. This includes argumentation for selecting a certain software tool, algorithm, performance metric, case study.
- Case studies can be very useful, but please reflect on what they represent. If you study a certain type of building, how representative is that for the wider building stock? Again, please make an argument for your case study selection.
- In dissertations, please do not spend time on discussing generics (qualitative versus quantitative research) or on the approaches you are not using. The reader wants to know what you have done, and why – not what you have discarded.

### **Content 4: Results**

- Normally the result section is the one I have least comments on, as this represents the data you have gathered through your studies – so in theory there should be nothing to argue about, as these are the facts you report. But please do make sure you present material that is interesting. If there is a lot of repetition then condense things and consider making additional material available online, or put this in an appendix.
- If the subject of your research is a specific building / case study, please include a figure or photo of that building. Remember that a picture says more than a thousand words.
- If you develop equations, make sure to point out where they connect to previous work by others. In this day and age, most work will build on accepted approaches and formulas. Explain what is common practice, with citation of sources, and point out what modifications, additions and novel combinations you have made.

### **Content 5: Analysis**

- Given the developments in machine learning, quite some analysis is based on advanced modelling and statistics. But please do reflect on what those models and statistics show you. Too many papers report the obvious – that a thicker insulation thickness or lower ventilation rate reduces heat loss in winter, for example. But we knew that from basic building science 101 already. If in need, make sure to read work like Streiner (2013).
- Papers in machine learning or artificial intelligence often end by claiming that method A outperforms method B – say, the Support Vector Machine approach gives slightly better results than the Artificial Neural Network. But ask yourself whether this is really a generalizable finding, or whether that just happens to be the case for the sample you have studied. If someone else studies a variation of your case, will this observation really hold true?
- Many papers contain a validation section. But in many cases this is just a demonstration of feasibility of a method within a limited context. Make sure you have good definitions of validation and verification, and apply the correct term.

### **Content 6: Discussion**

- Some authors try to combine results and discussion. However, there is a good reason to keep them separate. Results typically show the data that has been gathered, the outcomes of experiments and similar. These represent the facts you have obtained, without any judgement or interpretation. In a discussion section, you review these outcomes and add your subjective view. By keeping them apart, a reader can take in the facts and interpretation as separate elements.

### **Content 7: Conclusions**

- Conclusions need to be more than another abstract. Please do not just give a summary of what is described in the paper. Make some effort to point out the novel insights you have gained, the contribution to knowledge you have made.
- Make sure to close the loop on aim and objectives as stated in the introduction. Too many papers fail to do this.
- Conclusions should leave the reader with something to think about. To do so, they should be more than flat statements. Make them thought-provoking by reflecting on what needs to be done next, what practical implications may be expected of your research, or pointing out new challenges that emerge.

### **Content 8: References**

- Some papers are good in itself, but seem to stem from a different world. One place where this is very obvious is when there are no references from the target publication. If you want to publish in *Journal X*, I would normally expect some references to earlier publications in *Journal X*. If you don't have such references, I expect something quite exceptional and novel.

### **Presentation**

- Most publications have extensive 'author guides' that explain what is expected of your manuscript. Please adhere to these; I would rather be discussing the content of your paper than having to comment on your reference style or something like that.
- Sometimes there are problems with the language of a paper. But I don't feel it is my job to list spelling and grammar errors in your work. If there is just one or two I may point them out but otherwise I will make a polite remark saying that the text needs to be reviewed for English, preferably by a Native speaker.
- Always remember that abstracts should be written in a way that they can be 'stand alone'. Do not include any specialist abbreviations that then are explained in the main text. Also keep in mind that the abstract is your chance to 'sell' your work to the reader browsing for information – they will make up their mind about engaging with the full work by reading the abstract.
- Highlights are a feature that sits somewhere in between the title and the abstract. Mind the guidelines, typically they should be short and concise. But don't overdo it – I see too many that do not make sense when read by themselves. Don't give me broad generalities either.
- When providing figures, keep in mind that these may be printed locally on a black-and-white printer. Will any coloured lines/labels still be readable when that happens?
- If you use figures that you have not made yourself, make sure that you have permission to use the material – copyright applies to imagery just the same as it does to texts.

### **Response and Rebuttals to Reviewers**

- Sometimes I get a long response to my comments, which can be as much as a full page per issue, but without there being any substantial change to the manuscript. Such responses do not help to improve the quality of the submission, which is one of the main objectives of the reviewing process. If you have a page of material to convince me as reviewer, try to insert that material in the paper – it is likely that readers will have the same questions, and will benefit from this effort.
- The worst response that I encounter to a review is a nice letter from the author(s) thanking me for my review and comments, assuring me that all points have been addressed – and then on inspection I find that there only are some very minor edits at the start and end of the manuscript. This is a waste of my review time, and instantly puts me in a mood to wanting to fully reject the whole paper. Please don't play games; my time is too valuable to me to engage in this.
- A final point: sometimes responses can be quite adversarial. Such responses try to point out that the reviewer has missed key points, failed to see the obvious, lacks the appropriate background knowledge, or generally disagree with the review. Please bear in mind that reviewers do their work as service to the academic community, mostly for free. Their comments are there to help improve the paper. If the reviewer 'did not get it', please check your manuscript and see what you can do to prevent this from happening. A belligerent rebuttal is unlikely to help your paper get accepted.

### **References**

- Johnson, S., 2011. *Getting it across: a guide to effective academic writing*. Amsterdam: Techne Press
- Heard, S., 2016. *The scientist's guide to writing – how to write more easily and effectively throughout your scientific career*. Princeton: Princeton University Press
- Streiner, D., 2013. *A guide for the statistically perplexed – selected readings for clinical researchers*. Toronto: University of Toronto Press