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What constitutes a good literature review and why does its quality matter?

Holger R. Maier

School of Civil, Environmental and Mining Engineering

The University of Adelaide

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If you are anything like me, you have become increasingly frustrated with the poor quality of the literature reviews of many of the manuscripts you have been reviewing for journals and the need to repeat the same comments ad nauseum. In my experience, many literature reviews nowadays consist of pseudo-random lists of papers related to the problem domain of interest, followed by a statement of what was done in the current paper. No direction. No critical analysis of the literature. No identification of knowledge gaps. No linking of the purpose of the current paper to these gaps. So why is this a big deal? In order to answer this question, we have to consider what the purpose of research is.

To my way of thinking, the purpose of research is to discover something new and useful. This could be a new modelling technique, an advancement of an existing modelling technique or new insight into a particular modelling approach, environmental problem or physical process. However, in order to know if our research is new and adds something to the existing body of knowledge, we need to determine what the current state of knowledge is. This requires the identification of knowledge gaps in the problem domain being considered, as depicted in the simplified conceptual “Swiss cheese” model in Figure 1. A good way of achieving this is via recent review papers, where available (e.g. Abrahart et al., 2012; Krueger et al., 2012; Maier et al., 2010; McIntosh et al., 2011; Pearson et al., 2011; Razavi et al., 2012). However, even with such assistance, the identification and articulation of the problem domain and knowledge gaps is still not an easy task, as both are rather fuzzy and ill-defined.

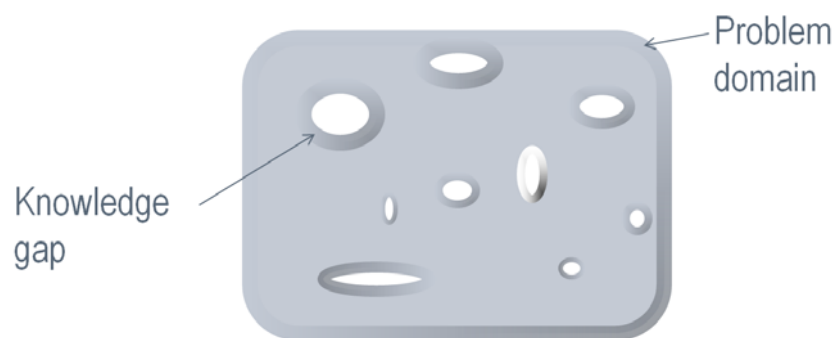


Figure 1: Simplified Conceptual “Swiss Cheese” Model of Purpose of Literature Review

The first step in the process of identifying and articulating the knowledge gaps is the identification of the problem domain, which is the research field in which the paper is making a contribution. This step is vitally important, as different lines of argument can often be developed in relation to the novelty and significance of a particular body of research (e.g. the contribution can be related to an advancement in the modelling approach or in relation to the particular environmental problem considered). However, in many manuscripts, there is no well-defined line of argument and the problem domain in which the paper aims to make a contribution is not defined clearly. This makes it extremely difficult to identify knowledge gaps and hence the novelty and significance of the contribution of the paper.

Once the problem domain has been defined, a *critical* discussion of the literature is required (Figure 2). This requires the categorisation or grouping of the major research themes / topics / categories that fall within the

problem domain (e.g. the different ways in which the modelling issue being addressed has been tackled, the different ways models have been formulated in order to address the environmental problem considered, the different facets of an environmental problem that have been modelled etc.). Next, there needs to be a *critical* comparison of papers within these categories (e.g. the degree to which different issues have been addressed in different papers, the advantages and disadvantages of various modelling approaches adopted in different papers (e.g. computational efficiency, accuracy etc.)). This is vital in terms of being able to identify knowledge gaps and research needs, which should provide the motivation and justification for the current paper. As shown in Figure 2, the knowledge gaps and research needs identified as part of the critical review of the literature should be linked directly to the research objectives, which should be stated clearly and explicitly. The inverted pyramid shape in Figure 2 signifies the increased focus in the literature review from the definition of the problem domain, to the critical discussion of the literature within this domain, to the identification of research needs and knowledge gaps within the literature, to a clear statement of research objectives, which should address one or more of the knowledge gaps and research needs identified as part of the critical review of the literature.

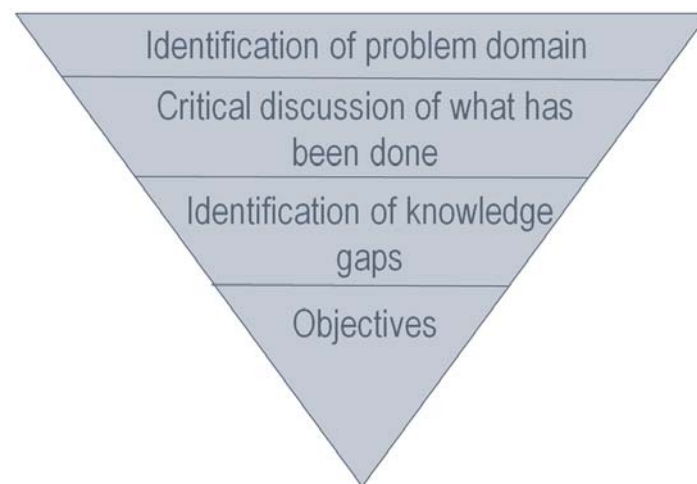


Figure 2: Conceptual “Inverted Pyramid” Model of Steps in the Writing of the Literature Review

As the research needs and gaps identified in the literature review have a direct effect on the research objectives, the quality of the literature review also has a significant impact on the quality of the remainder of the paper, including the Methodology, Results and Conclusions, as illustrated in Figure 3. In other words, once the objectives have been stated explicitly and linked with identified knowledge gaps and research needs, there is a flow-on effect to the Methods, Results and Conclusions sections. The Methodology section includes an outline of what was actually done (e.g. methods used, analyses conducted) in order to meet the stated objectives, the findings of these investigations are given in the Results section and the meaning of the findings in relation to the objectives is given in the Conclusions. Consequently, there are direct links between the objectives and the content in each of the other sections in the paper.

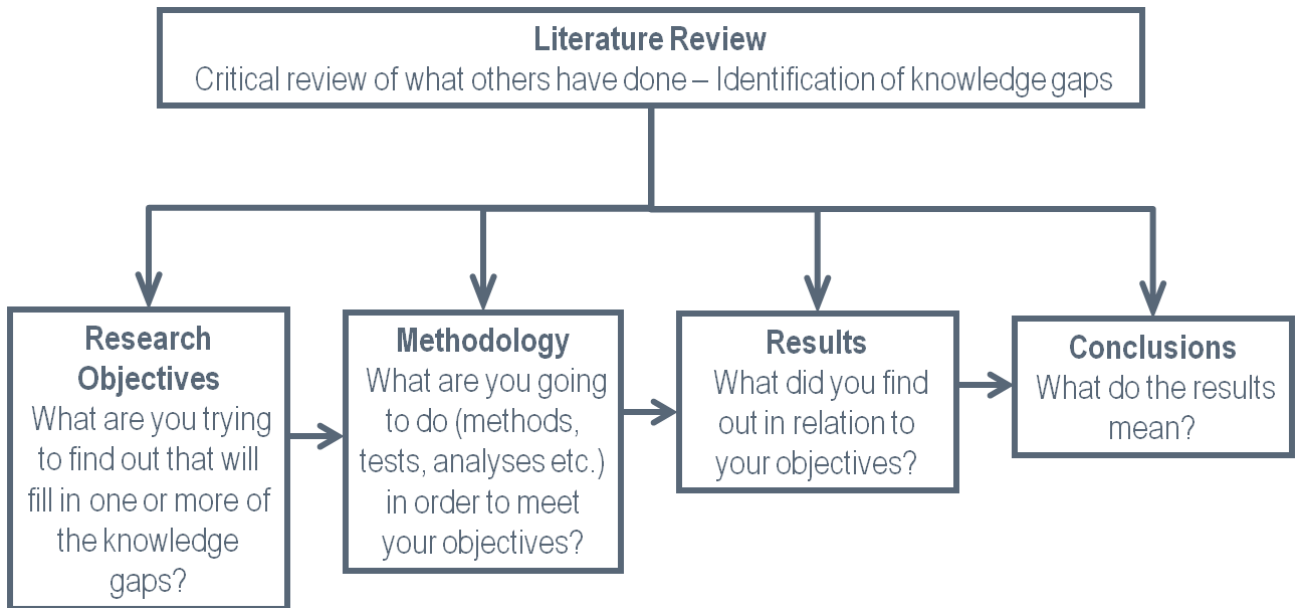


Figure 3: Conceptual Representation of the Impact of the Literature Review on Objectives, Methods, Results and Conclusions

In conclusion, the quality of the literature review is extremely important, as its purpose is to identify knowledge gaps / research needs in the problem domain / research area in which the paper is intended to make a contribution to knowledge. This requires clear specification of the problem domain and a *critical* review of the literature within this domain in order to present a clear line of argument that identifies knowledge gaps and research needs that need to be addressed. The objectives of the paper need to address one or more of these knowledge gaps / research needs. In addition to identifying the contribution to knowledge of a paper, the quality of the literature review is also vital in terms of setting up the flow of the remainder of the paper, including the Methodology, Results and Conclusions.

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References

Abrahart, R.J., Anctil, F., Coulibaly, P., Dawson, C.W., Mount, N.J., See, L.K., Shamseldin, A.Y., Solomatine, D.P., Toth, E., Wilby, R.L. 2012. Two decades of anarchy? Emerging themes and outstanding challenges for neural network river forecasting. *Progress in Physical Geography* 36 (4), 480-513.

Krueger, T., Page, T., Hubacek, K., Smith, L., Hiscock, K., 2012. The role of expert opinion in environmental modelling. *Environmental Modelling & Software* 36, 4-18.

Maier, H.R., Jain, A., Dandy, G.C., Sudheer, K.P., (2010) Methods used for the development of neural networks for the prediction of water resource variables in river systems: Current status and future directions. *Environmental Modelling & Software* 25(8) 891-909.

McIntosh, B.S., Ascough II, J.C., Twery, M., Chew, J., Elmahdi, A., Haase, D., Harou, J.J., Hepting, D., Cuddy, S., Jakeman, A.J., Chen, S., Kassahun, A., Lautenbach, S., Matthews, K., Merritt, W., Quinn, N.W.T., Rodriguez-Roda, I., Sieber, S., Stavenga, M., Sulis, A., Ticehurst, J., Volk, M., Wrobel, M., van Delden, H., El-Sawah, S., Rizzoli, A., Voinov, A., 2011. Environmental decision support systems (EDSS) development – Challenges and best practices. *Environmental Modelling & Software* 26 (12), 1389-1402.

Pearson, L.J., Nelson, R., Crimp, S., Langridge, J., 2011 Interpretive review of conceptual frameworks and research models that inform Australia's agricultural vulnerability to climate change. *Environmental Modelling & Software* 26 (2), 113-123.

Razavi, S., Tolson, B.A., Burn, D., 2012. Review of surrogate modelling in water resources. *Water Resources Research* 48.