



M E T H O D O L O G Y

We consider "Urbanism" a multidisciplinary area of research and practice, gathering urban design, spatial planning, data analysis and modelling, urban studies and sustainable technology, among others. Each area of knowledge asks different (but complementary) questions anchored on different ontology and epistemology. Different questions demand different methods to answer them. Sometimes, the same question can be answered from different perspectives. The Methods and Tools Sheets give an overview of methods used in Urbanism.

WHAT DOES METHODOLOGY 'DO'?

It would be funny (and frankly wrong) to talk about methodology as a method, because methodology refers to "the body of methods, rules, and postulates employed by a discipline : a particular procedure or set of procedures" (Merriam-Webster, 2013). In other words, methodology is the design of the steps employed in a research or design process to achieve the desired results or to answer the questions stemming from a particular problem,

within a certain theoretical framework or perspective. Remember that every academic or scientific endeavour (and maybe every design) stems from a question. You can think of this question as a kind of "puzzlement" or a "problem" in its original conception: "a task, a proposition, a question". Different disciplines have different normative and theoretical dimensions that trigger different questions. These different questions require

the use of different methods of research. At least in this case, the Wikipedia entry is quite accurate, so we will use it: "Methodology is the systematic, theoretical analysis of the methods applied to a field of study, or the theoretical analysis of the body of methods and principles associated with a branch of knowledge. It, typically, encompasses concepts such as paradigm, theoretical model, phases and quantitative or qualitative techniques".

WHY DO WE NEED METHODOLOGY?

Having a methodology responds to several needs in academic research. First, a methodology helps you to be systematic and to control the process of knowledge building. By mapping the steps you take to answer your questions, you can control the quality and the validity of the methods, and make sure they make sense together. By applying methods that have been tested before, you can more easily produce good results. This speaks to the replicability of your experiments. In simple words, this means you would obtain more or less the same results if you used the same methods on the same or similar case, thus underscoring the validation and verifiability of results. It speaks also to the need to "triangulate" your results. This means that, by using different methods, you should get results that support each other (or at least that don't contradict one another). Methodologies are generally anchored in communities of practice or communities of knowledge who seek answers to similar questions using similar methods stemming from a similar epistemology (ways of knowing). Take the canals of Amsterdam for example: you can study them from a water engineering perspective, from an environmental perspective, from a historical perspective, from an urbanistic perspective, from a literary perspective, from a transport perspective, from a building technology perspective and so on. Each one of these disciplines "asks" different questions from the canals and each set of questions within each discipline require a set of methods and steps (a methodology) to answer them. The methodology is what connects your question with your answer. However, I must remind you: Don't mix up methodology with the scientific method! The scientific method is a "meta-methodology" and does not respond to all epistemologies equally well.

IT HELPS WITH KNOWLEDGE VALIDATION

LIMITATIONS

Urbanism is at the crossroads of various disciplines. It incorporates elements from the social sciences, from the physical sciences and from design, which have very different epistemologies. In the social sciences, your interpretative powers are essential, while the physical sciences are all about an empirical understanding of the physical world. Design is a case apart! Much has been discussed about design's epistemology, or in other words, whether design has a special "way of knowing". TU Delft prides itself on "research by design" (see references in "further reading"). However, it is a bit difficult to understand what "research by design" actually means in terms of questions being asked and the methods used to answer those questions. We believe you will be better equipped to understand research by design if you can recognise different epistemologies, and very importantly, if you understand what an academic attitude and scientific methods are. By doing so, we believe you will be able to locate your knowledge in the right place and understand the very different, very unusual ways in which design can contribute to an academic endeavour. This also makes us question what people mean when they say "design". Do they mean the design of artefacts, or the design of processes and relationships? Or both? Is design the same thing as "project"? Different concepts of design call for different epistemologies (ways of knowing) and obviously different methodologies. This is why we say Urbanism is multi- (combining or involving several academic disciplines or practices) and trans-disciplinary (when two or more discipline perspectives transcend each other to form a new holistic approach). *See the Methods and Tools Sheet for Multi-, Inter- and Trans-disciplinary Approaches.

DIFFERENT WAYS OF KNOWING

HOW DO YOU DO IT?



The following text is (loosely) adapted from McCombes, S. (2019). *How to Write your Research Methodology in Four Steps*, Scribbr. Available from: <https://www.scribbr.com/dissertation/methodology/> Remember this is a summary; you can always consult books and websites for more detailed explanation.

How to Write a Research Methodology in Seven Steps

In your thesis or dissertation, you will have to discuss the methods you used to do your research. The methodology chapter explains what you did and how you did it, allowing readers to evaluate the reliability and validity of the research. It should include:

1. The type of research you did (the perspective you used, AKA the logic of enquiry), expressed in your research question and sub research questions.
2. Your theoretical framework, which explains your logic of enquiry and frames it in terms of the theories and ideas on which you base our assumptions.
3. Your conceptual framework, which maps the concepts (not only theories, but also perspectives, values and ways of doing) and shows the reader how they are connected to each other.
4. Your rationale for choosing those methods and the relevance.
5. How you collected your data (methods of data collection).
6. How you analyzed your data (this could be quantitative or qualitative approaches).
7. A description and evaluation of the tools or materials you used in the research.

The methodology section should generally be written in the past tense. APA has a guideline for writing a methodology section, but you need to adapt it to Urbanism.

STEP 1: Describe the type of research you did. You can start with sentences like: This research addresses the canals of Amsterdam from the point of view of their engineering make-up, their hydraulic capacity and their ability to sustain shocks in temperature and water levels. This is relevant to prepare the historic canals for the threats presented by climate change. It is worth to repeat the problem statement very briefly, to remind the reader what the challenge is.

It is important to announce your research question very soon afterwards, to guide the attention of the reader, but it is the sub-research questions that will actually help you define the methods. This may sound strange, but the main research question will be answered by the whole research, while the sub-research questions should very direct, simple and explore elements of the main research question. In the research above, the main research question could be: *How to make the canals of Amsterdam structurally more resilient to extreme temperature and water level variations, in light of their historic and scenic importance for the city of Amsterdam?*

This RQ spans a variety of fields, and examples of sub-RQs could be:

1. What are the structural problems related to the canals of Amsterdam that make them vulnerable to climate change? This could be answered via literature review, empirical experimentation (e.g., testing materials), interviews, etc. This is an quantitative/ empirical approach.
2. What is the state of the art in urban canals construction and maintenance? This could be done via literature review, study of best practices, interviews, etc. There is a mix of quantitative and qualitative methods.
3. What are the historic conservation values and parameters that influence the canals and their maintenance? This could be done via policy analysis, historic analysis, laws and regulations analysis, but also interviews. This is more of a qualitative approach, although policy analysis could potentially use quantitative approaches, with word classification or sentiment analysis for instance.

4. What are the scenic values related to the maintenance of the canals of Amsterdam? This admits a variety of methods, like interviews, focus groups, policy analysis, interviews, workshops and so on. Most of these methods are qualitative in nature.

You can also explain what your research “does”. For example, did you aim to systematically describe the characteristics of something, to explore an under-researched topic, or to establish a cause-and-effect relationship? And what type of data did you need to achieve this aim? Did you need quantitative data or qualitative data?

Depending on your discipline and approach, you might also begin with a discussion of the rationale and assumptions underpinning your methodology.

STEP 2: Describe your theoretical framework. This is central in your methodology and informs the reader about the field of ideas and perspectives (and incidentally, the logic of enquiry) you are using in your research. For example, resilience is a growing areas of studies, and there is dispute about what resilience includes and excludes, and how it relates to sustainability and justice, for example. A quick literature review will give you the elements you need to respond to this topic. There is a “methods & tools” sheet on the THEORETICAL FRAMEWORK.

STEP 3: Describe your conceptual framework. The conceptual framework is a concept mapping exercise, in which you explain how the various concepts, ideas, frameworks and values are connected. There is a “methods & tools” sheet on the CONCEPTUAL FRAMEWORK.

STEP 4: Describe your rationale for choosing those methods and their relevance.

STEP 5: Describe the methods of data collection (see other “Methods & Tools” sheets. Did you need to collect primary data yourself, or did you use secondary data that was collected by someone else? See DATA COLLECTION methods and tools sheet.

STEP 6: Describe how you analyzed your data. This is really about describing the steps you took so that the reader can both check the validity of your procedures and reproduce the experiments or steps that led you to your answers. For example, did you gather experimental data by controlling and manipulating variables, or descriptive data by gathering observations without intervening?

STEP 7: Describe and evaluate the tools or materials you used in the research. Here you can point at the limitations and avenues for further research.

The following questions also help frame your methodology:

1. Why is this the most suitable approach to answering your research questions?
2. Is this a standard methodology in your field or does it require justification?
3. Were there any ethical considerations involved in your choices?
4. What are the criteria for validity and reliability in this type of research?

FURTHER READING



Creswell, J. W. (1994). *Research design : qualitative & quantitative approaches*. Sage Publications.

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