Methodology for Dissertations and Final Year Projects

Table of Contents

GCU Glasgow Caledonian University

University for the Common Good

Further information:

Learning Development Centre
School of Engineering and Built Environment
Glasgow Caledonian University

askldc@gcu.ac.uk
+44 (0)141 273 1230
https://www.gcu.ac.uk/ebe/ldc/

Methodology is the **What**, **How** and **Why Chapter** of your dissertation.

Here you **justify**
1. What research approach and method you adopted
2. Why you chose this approach and method
3. What data you collected
4. How you have collected them

1. Ethical considerations

For your dissertation/final year project, do you intend to use:

- Focus groups?
- Interviews?
- (online) surveys?
- Observations?
- Questionnaires?
- Lab experiments?
- Simulations?
- Case studies?

Then your research involves people. There are rules that protect you as a researcher from misconduct and the people involved in your research from harm.

Therefore, you need to comply with the 5 principles of research ethics:

1. Minimising risk of harm.
2. Obtaining informed consent.
3. Protecting anonymity and confidentiality.
4. Avoiding deceptive practices.
5. Providing the right to withdraw.

Before you start your project, you should acquaint yourself with the **Department's ethical guidelines**.

You will also need to submit an ethics application. More information on that can be found on GCU Learn.

2. Methodology – why is it important?

A detailed description of the methodology is the best way to document your research process. That is,

- **Research is not about proving something!**
- **Research is not** only about gathering information, documenting facts, browsing for information.
+ **Research** is the **process of collecting**, **analysing**, **and interpreting data** in order to understand a phenomenon (Leedy & Ormrod, 2001).
+ **Research design** determines how **information** is **collected** and **recorded**; what the type of **data** is **produced** and what **conclusions** can and cannot (!) be drawn based on the proper analysis of the data.

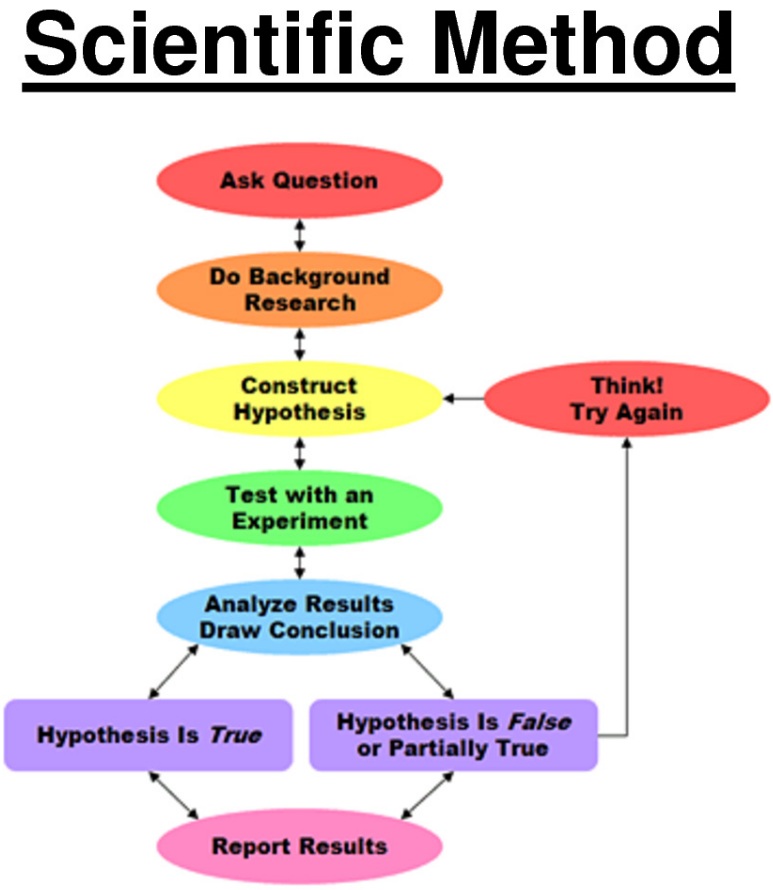

Image taken from: UNIVERSITY OF NEW HAMPSHIRE. 2015. Scientific Method. Available from: http://libraryguides.unh.edu/c.php?g=326686&p=2190842

The methodology chapter is probably your most important chapter because the findings, discussion and analysis are based on it.

The methodology chapter needs to:

Clarify:

- how you approached your research project, i.e. describe what you have done;
- why you have done it in a certain way.

Discuss the **methods** you used. It is **crucial** because you need to ensure your research is **reliable**, **valid** and **replicable**.

- **Reliability =** the method you use produces similar results under similar conditions.

  Think: You design a questionnaire and the same questionnaire produces similar results from 2 or more different groups of people.

- **Validity =** the method really measures what you think it measures and not something else.

  Think: Look at the two questions from a questionnaire:

  I think sustainable design is important.

  In my opinion, designing sustainable buildings is essential.

  Are they measuring something different or the same?

- **Replicability =** someone else working independently from you can exactly reproduce your methods.

  Think: You write the methods section of your thesis/final year project in a way that someone else can follow what you did step by step.

  Should you be unsure about these or other key terms, check them here
  http://dictionary.reference.com/science

3. Methodology Structure and Subsections

The methodology section should be divided into numbered subsections like:

1. Study Design and Rationale
2. Ethical Approval
3. Participants
4. Instruments (Methods)
5. Pilot (Pre-test)
6. Procedure
7. Data Acquisition and Representation
8. Limitations

These are example sections; please refer to your module handbook on GCU Learn for details.

3.1. Study rational and design

What approach did you adopt and **why**? Use **references** to **support** your reasons/explanation.

For instance:

- *An information-theoretical approach was adopted because it allowed the researcher to…*
- *Bell (2002) argues that an information-theoretical approach allows…*

What research method did you use and **why? What type of data** does it produce? Use references to support this.

- *An Implicit Association Test (IAT) was used to obtain Reaction Time (RT) data and Error rates, which would allow… .*
- *A semi-structure interview was used to gather qualitative data which permits to draw conclusions about … .*

3.2. Ethics Approval

Ethical approval guidelines are available in the **module handbook** on GCU Learn.

3.3. Participants

State the **number of participants**, *composition of the group* age, gender) and **sampling method** applied. State the **selection criteria**.

- *Sixteen participants (13 female, mean age 22.6 years), recruited by convenience sampling from Glasgow Caledonian University under-graduate and post-graduate students, were invited to participate in the study. Participants needed to be English native speakers with normal or corrected to normal eye sight.*

3.4. Equipment/Instrumentation

- *The equipment/instruments used in the study were …*

3.5. Pre-test meeting or Pilot study.

If applicable: This subsection records any

(A) pre-test requirements or

(B) pilot study,

which caused you to review or change the procedure/instrumentation.

(A) *During an initial test the researcher compared the impact of three local variables on wind turbine effectiveness: sea side, hills, flat field.*

(B) *Initially, before any testing began, a pilot study was carried out to familiarise the researcher with the testing instruments.*

(B) *Responses to the questionnaire in the pilot study resulted in certain questions being removed or redrafted because they were ambiguous or imprecise.*

3.6. Procedure

You need to **describe the research process in detail** from start to finish, e.g. **where, when, how, for how long**, in **what order** events occurred.

- *A face to face survey was conducted in Buchanan Street Bus station on…*
- *A controlled laboratory experiment was conducted…*
- *Firstly students were asked to look at three images for 30 seconds, and then…*

3.7. Data Preprocessing and Analysis

You need to describe and discuss how information was gathered and presented.

- *NVivoTM computer software package was used to analyse and present the data in table form, displaying the results …*
- *Telephone interviews were recorded using Audacity and described for later analysis. Complete transcriptions can be found in the appendix 1…*
- *An Analysis of Variance (ANOVA) on the error rates was conducted using the SPSS software package.*

3.8. Limitations

The **most common** limitations are **time** and **cost constraints** or **research protocols**. These may include difficulty in **accessing subjects** or **reliable information**, limitations of **sample size** or **selection criteria**, **poor response** (particularly with postal surveys) or **researcher bias** (often with focus groups/ open ended questions/observation).

Further reading:

Breach, M., 2009. Dissertation Writing for Engineers and Scientists. Pearson Education.

Dawson, C., 2009. Introduction to research methods: A practical guide for anyone undertaking a research project. Hachette UK.

Fellows, R.F. and Liu, A.M., 2015. Research methods for construction. John Wiley & Sons.

Field, A., 2013. Discovering statistics using IBM SPSS statistics. Sage.

Flick, U., 2015. Introducing research methodology: A beginner's guide to doing a research project. Sage.

Hirsch, H., 2004. Essential communication strategies: For scientists, engineers, and technology professionals. John Wiley & Sons.

Knight, A. and Ruddock, L. eds., 2009. Advanced research methods in the built environment. John Wiley & Sons.

Naoum, S.G., 2012. Dissertation research and writing for construction students. Routledge.