ENGINEERING PHD METHODOLOGY SELF-CHECK

Design, Setup, Sampling and Sample Size for Australian PhDs

You have chosen your method and drafted your chapter. Before you hand it in, work through this research design checklist to catch gaps in your design, setup, sampling methods and sample size. Print it, or tick the boxes in Word as you go. Tick Yes only when your chapter shows the answer clearly on the page, not just in your head. Every No is a fix to make before your supervisor or examiners find it.

Research Design:

◉ Research Design:

- Have you named your approach clearly: experiment, simulation or mixed methods? Yes ☐ No ☐
- Does the chapter explain why this approach suits your research question better than the alternatives? Yes ☐ No ☐

◉ Research Questions:

- Have you named your approach clearly: experiment, simulation or mixed methods? Yes ☐ No ☐
- Does the chapter explain why this approach suits your research question better than the alternatives? Yes ☐ No ☐
- Does the chapter link back to the aims set out in Chapter 1? Yes ☐ No ☐

Setup and Equipment:

◉ System Model:

- Are your model, equations, assumptions and parameters fully stated? Yes ☐ No ☐
- Have you given the software name and version? Yes ☐ No ☐
- Could another engineer rebuild your model from the description alone? Yes ☐ No ☐

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◉ Equipment and Facilities:

- Are instruments, prototypes and calibration details listed, with model numbers? Yes☐ No ☐
- Have you recorded risk assessments and safety approvals? Yes☐ No ☐
- Have you named the laboratory or facility used, and any industry partner support? Yes☐ No ☐

Sampling and Sample Size:

◉ Sampling Methods:

- Have you explained how test cases, operating points or datasets were selected? Yes☐ No ☐
- Is the selection free of obvious bias, or is any bias acknowledged? Yes☐ No ☐
- Have you stated the operating ranges and test conditions you covered? Yes☐ No ☐

◉ Sample Size:

- Have you shown your sample size calculation, or explained why a calculation did not apply? Yes☐ No ☐
- Could a reader see why that number is enough to support your conclusions? Yes☐ No ☐
- Did you repeat measurements enough to estimate variability? Yes☐ No ☐

Validation and Analysis:

◉ Validation:

- Are simulation results compared with measured data or a published benchmark? Yes☐ No ☐
- Have you reported measurement error, tolerances and how you handled noise? Yes☐ No ☐
- Do you explain any gap between simulated and measured results? Yes☐ No ☐

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◉ Analysis:

- Are your statistical tests or performance metrics named and justified? Yes☐ No ☐
- Did you set your success criteria before looking at the results? Yes☐ No ☐
- Are the limits and assumptions of your analysis stated honestly? Yes☐ No ☐

Ethics and Data:

◉ Ethics and Integrity:

- If people are involved, have you recorded ethics approval under the National Statement on Ethical Conduct in Human Research? Yes☐ No ☐
- Have you noted data ownership, authorship and any industry partner agreements? Yes☐ No ☐

◉ Data Management:

- Do your storage and backup follow your university policy and the Australian Code for the Responsible Conduct of Research? Yes☐ No ☐
- Can a reader reproduce your results from your code, parameters and datasets? Yes☐ No ☐

Writing and Presentation:

◉ Structure:

- Does the chapter follow your university's HDR handbook and your supervisor's advice? Yes☐ No ☐
- Are table captions above tables and figure captions below figures, with both cross-referenced in the text? Yes☐ No ☐
- Is the tense consistent: past for completed work, future for a proposal? Yes☐ No ☐
- Have you compared your headings with the Methodology Chapter Template? Yes☐ No ☐
- Is the chapter length in proportion to the rest of your thesis? Yes☐ No ☐

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◉ Citations:

- Is one citation style used throughout? Yes☐ No ☐
- Does every cited source appear in your reference list, and vice versa? Yes☐ No ☐

Once every box says Yes, your methodology chapter is ready for your supervisor. Any No is a gap worth fixing now. PhD Assistance can review your chapter and close those gaps through our Electrical Engineering PhD dissertation research methodology chapter writing services. When your methods are settled, the next step is data analysis. Bring your answers to your next supervisor meeting.

Next: Engineering PhD Research Methodology in Australia: The Questions HDR Candidates Actually Ask, clear answers to the questions this checklist raises.

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