

Writing a coherent and defensible research methodology chapter

A practical, multidisciplinary workshop for master's students

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Workshop Outcomes

By the end, you should be able to:

- Identify the evidence your research question requires.
- Choose and justify a coherent set of methods.
- Recognise claims your design cannot support.
- Improve your own methodology chapter.



FOUNDATIONAL PRINCIPLE



Methodology is an argument—not stitched-together sections

NOT A CHECKLIST

A thesis methodology is not an arbitrary collection of sections, labels, tools or techniques.

USE A RECOGNISED FRAMEWORK

Select an appropriate methodological framework from established scholarship to organise research and design decisions.

DEFEND THE FIT

Show why the framework and every consequential choice fit the research question, disciplinary context and evidence needed.

A published framework helps organise and make decisions traceable; authority alone does not establish methodological rigour.



A methodology is not a set of sections stitched together

Structure

Makes the chapter's decisions visible and logically ordered.

Alignment

Prompts checks between the question, assumptions, design and evidence.

Traceability

Lets readers follow how each choice leads to the next.

Justification

Creates a place to explain why choices fit better than alternatives.

Transparency

Makes assumptions, procedures and limitations open to scrutiny.

Critical use

The Research Onion is a guide— not proof that a design is sound.

Select a framework appropriate to your research; justify each choice independently of its authority.



FRAMEWORKS FOR DIFFERENT RESEARCH PURPOSES



Choose an established framework suited to the investigation

Saunders et al (2023) • Research Onion

Cross-disciplinary methodology decisions: philosophy, approach, methodological choice, strategy, time and techniques.

Creswell & Creswell (2023). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches

Connects philosophical assumptions with qualitative, quantitative and mixed-methods approaches.

Peppers et al (2007/2008). • Design Science Research

For artefact-centred inquiry: identify a problem, Define objectives of a solution, design and develop a solution, demonstrate and evaluate it and communication (Scholarly/Professional publications)

Paul et al. (2007) • Systematic Engineering Design

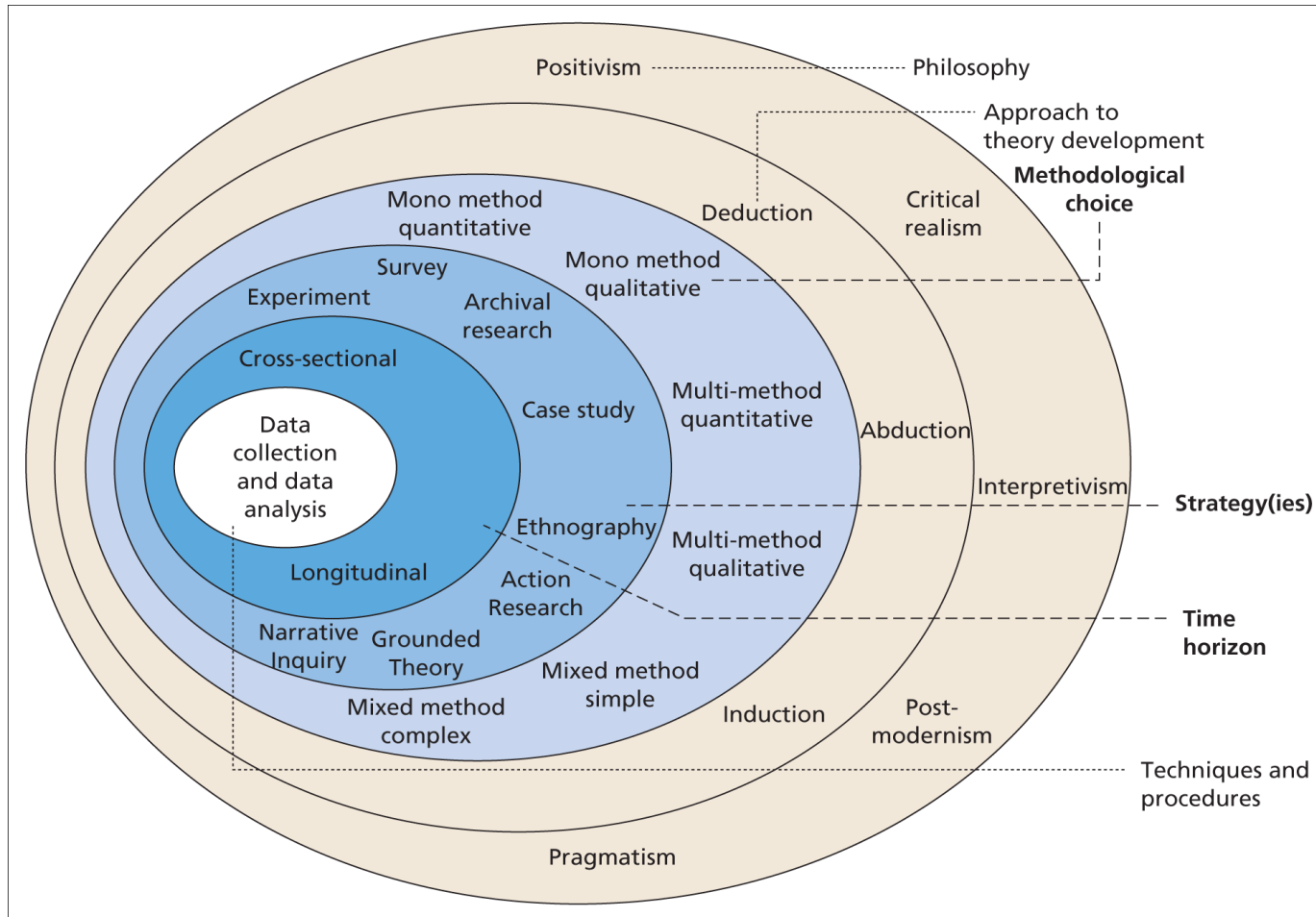
Structures engineering product development from requirements through conceptual, embodiment and detailed design.

These are not interchangeable: a chapter-organising framework, research methodology and engineering design process serve different functions.





The Research Onion: check alignment across decisions



Begin with the question

Then use the layers to organise the decisions you must explain.

Move between layers

Check that your choices are consistent—not mechanically predetermined.

Defend the trade-offs

Explain alternatives, feasibility and limits to claims.



FIVE PHILOSOPHICAL POSITIONS



Saunders et al. discussed 5 philosophical choices

Positivism

Systematic observation, measurement and testing of propositions.

Critical realism

Examines empirical patterns alongside underlying mechanisms and contexts.

Interpretivism

Seeks to understand meanings and participants' situated interpretations.

Postmodernism

Questions dominant accounts; examines discourse, power and excluded perspectives.

Pragmatism

Judges methodological choices in relation to the problem and practical consequences.





How does the study engage with theory?

Deduction

Theory →
propositions/hypotheses →
observations and tests.

Example: test a predicted
relationship.

Induction

Observations / accounts →
patterns → conceptual
explanation.

Example: build categories
from interviews.

Abduction

Move between surprising
evidence and plausible
explanations.

Example: revise an
explanation after
unexpected findings.



Methodological choice: what form of evidence?

Quantitative

Numerical measures, comparisons, estimation, testing or modelling.

Ask: are constructs measurable with adequate precision?

Qualitative

Accounts, observations, texts or other material examined for meaning and process.

Ask: does this evidence address the phenomenon?

Mixed methods

Combines and integrates qualitative and quantitative components.

Ask: what can integration answer that either component alone cannot?



Design, strategy and technique are not synonyms

PURPOSE / DESIGN

Exploratory, descriptive, explanatory; experimental or non-experimental structure

STRATEGY

Survey, experiment, case study, action research, ethnography, archival inquiry

TECHNIQUE

Questionnaire, interview, observation, sensor reading, document extraction



Time horizon changes what you can claim

Cross-sectional

Measurements or accounts gathered at one period.

Can assess patterns or associations; on its own it does not establish temporal order.

Longitudinal

Observations at multiple times.

Can investigate change and sequence, subject to design quality and other limitations.

Never write “X caused Y” simply because a cross-sectional association is statistically significant.





Sampling begins with the target population

Population / cases

Who or what is the study about?

Selection

Probability, purposive, convenience, theoretical or other logic?

Sample size

What precision, information richness, power or feasibility justifies it?

Limitations

Who is generalise excluded, and to whom can findings transfer or?



The instrument must produce the evidence needed

Research question → **Construct / phenomenon** → **Observable evidence**

- Survey items: construct coverage, wording, scale quality and pilot testing.
- Interviews: prompts aligned with the question and sufficient depth.
- Experiments/measurements: protocol, calibration, comparison and controls.
- Documents / secondary data: provenance, completeness and fit.

Analysis follows the question and data

Numerical evidence

Descriptives → estimation / comparison / associations / modelling.

Check scale, missingness, assumptions, uncertainty, effect sizes and dependence of observations.

Textual / observational evidence

Coding and interpretation → patterns, themes, processes or cases.

Explain the analytical procedure, transparency, reflexivity and credibility checks.

Name the analysis *and explain what it will establish*.



Quality, ethics and feasibility are design decisions

Research quality

Measurement validity, reliability, credibility, transparency and fit between claims and evidence.

Ethical safeguards

Consent where appropriate, participant protection, confidentiality, data security and responsible reporting.

Feasibility

Access, recruitment, equipment, time, skills and resources shape what can realistically be defended.



Characteristics of good methodology and research design

Coherent

Question, evidence, design and analysis fit.

Justified

Consequential choices are argued, not listed.

Rigorous

Procedures match the question and field.

Transparent

Steps, assumptions and decisions are reported.

Replicable / auditable

Procedures can be repeated or scrutinised.

Ethical & feasible

Risks, consent, access and resources addressed.

Credible & bounded

Quality checks and warranted claims are clear.

Replicability is not identical findings: experiments emphasise reproducible procedures/results; qualitative studies emphasise transparent documentation and an auditable analytic trail.





A chapter is an argument, not a catalogue

- 1 Choice** What exactly did / will you do?
- 2 Rationale** Why does this decision fit the question?
- 3 Support** What methodological literature or evidence supports it?
- 4 Trade-off** What does the choice not allow you to claim?





From an unsupported statement to a justification

Weak

“A quantitative approach was selected because it is objective and easy to analyse”

Stronger

“A quantitative approach was adopted because the study seeks to measure predefined constructs and statistically examine hypothesised relationships among them. Quantitative methods allow these constructs to be operationalised using standardised measures and enable statistical evaluation of the proposed relationships”.

The stronger version connects purpose, design, evidence and limitation.

Five recurring methodological pitfalls

- Starting with a preferred tool instead of the research question.
- Treating philosophy, strategy and data collection as interchangeable.
- Claiming representativeness without a defensible sampling basis.
- Using an analytical technique without checking fit and assumptions.
- Overstating causal or generalisable conclusions.



Activity: conduct a five-minute coherence audit

QUESTION	What exactly am I trying to establish?
EVIDENCE	What data are necessary and available?
DESIGN	Do choice, strategy, time and sampling fit?
ANALYSIS	Will the plan answer my question?
LIMITS	Which claims must I avoid?

Write down one mismatch and one revision.

A practical methodology chapter outline

- 01 Introduction and research-question alignment
- 02 Research Philosophy and approach to theory development
- 03 Methodological choice, design and strategy
- 04 Context, population/cases and sampling
- 05 Data sources, instruments and procedures
- 06 Data analysis and research quality
- 07 Ethics, limitations and chapter conclusion

Adjust headings to your programme, discipline and thesis requirements.

THE CENTRAL TEST

Can I defend every major methodological choice as a credible way to answer my research question?

Takeaway: alignment • justification • limitations

Questions & Discussion



Selected references and source lectures

Saunders, M., Lewis, P., & Thornhill, A. (2019). Research methods for business students (8th ed.). Pearson. [Research Onion; check edition used in the course.]

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Thank
you



