

Research Design Simplified: A Practical Guide to Ontology, Epistemology, and Methodology

Research is a deliberate and planned activity, so it's very important that you know what you are doing and why. Research should always be 'question led' – you'll begin your research project with a question in mind. Your research question will then guide your research design.

To answer your research question effectively, you need to understand three key concepts:

1. **Ontology:** What can we know about reality?
2. **Epistemology:** How can we know it?
3. **Methodology:** What methods will we use to gather and analyse data?

The research question informs the choice of an appropriate ontological position (view of reality), which in turn guides the selection of an epistemological position (nature of knowledge). By clarifying your perspective on what can be known (ontology) and how we can know it (epistemology), you can then choose the most suitable methodology (data collection and analysis methods) to answer your research question. This deliberate sequence ensures that each step logically leads to the next, providing a coherent and effective research design.

Ontology: The Nature of Reality

Ontology is the study of the nature of reality or what exists. It concerns itself with the question of what is possible to know.

Put simply: What is it possible to know?

Ontological Positions

- **Realism:**
 - **Description:** There is a single, objective reality that exists independently of our perceptions.
 - **Application:** Useful for research that aims to discover universal laws or facts about the world, often through objective measurement and analysis.
- **Critical Realism:**
 - **Description:** There is a single reality, but our understanding of it is mediated by social conditions and human capacities.

- **Application:** Suitable for research that acknowledges the complexity of reality, the influence of social factors, and the importance of context.
- **Relativism:**
 - **Description:** There are multiple possible realities, not a single objective reality. We cannot claim that one version of reality is more true than another; knowledge is context-bound and diverse.
 - **Application:** Best for research that explores multiple perspectives and subjective experiences, emphasising the diversity of human understanding.

Epistemology: The Nature of Knowledge

Epistemology is the study of knowledge and how we acquire it. It deals with the nature, origin, and scope of knowledge and what constitutes valid knowledge in a given field.

Put simply: How can we know it?

Epistemological Positions

- **Positivism:**
 - **Description:** Knowledge is obtained through observable phenomena and empirical evidence. Reality is objective and can be measured and quantified.
 - **Application:** Ideal for research that seeks to test hypotheses, measure variables, and predict outcomes using scientific methods.
- **Post-positivism:**
 - **Description:** Recognises the limitations of positivism. Knowledge is influenced by human factors but a reasonably objective understanding is possible. Post-positivism holds that all observation is fallible and there is no absolute truth, but it still values rigorous scientific inquiry.
 - **Application:** Appropriate for research that accepts the influence of human perception but still strives for objectivity and rigor.
- **Constructionism:**
 - **Description:** Knowledge and reality are constructed by humans and influenced by social, historical, and cultural contexts.
 - **Application:** Suitable for research that focuses on understanding how people create meaning and how their social contexts influence their perceptions and knowledge.

Methodology: The Tools of Research

Methodology refers to the specific procedures or techniques used to gather and analyse data. It explains the *how* of the research (what you'll actually do) guided by your ontological and epistemological positions.

Put simply: The tools you use to get the data.

Research Methodologies

- **Positivist:**
 - **Description:** Uses quantitative methods like surveys, experiments, and statistical analysis to measure and analyse variables.
 - **Application:** Mostly used for studies that aim to quantify relationships between variables and generalise findings across larger populations. When thematic analysis (TA) is used, this is coding reliability TA (taking a deductive approach).
 - **Post-positivist:**
 - **Description:** Can use both quantitative and qualitative methods. Mostly uses a mix of quantitative and qualitative methods, such as quasi-experiments and content analysis.
 - **Application:** Suitable for research that benefits from both numerical data and in-depth qualitative insights to provide a more comprehensive understanding. When thematic analysis (TA) is used, this is codebook TA (a cluster of methods encompassing framework analysis, template analysis, network analysis, and matrix analysis), and incorporates both deductive and inductive approaches to analysis.
 - **Constructionist:**
 - **Description:** Uses qualitative methods like interviews, focus groups, and ethnography to explore in-depth meanings and experiences.
 - **Application:** Ideal for studies that aim to understand complex social phenomena from the perspective of those experiencing them, emphasising context and subjectivity.
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Examples of Research Question = Ontology + Epistemology + Methodology

The research question therefore informs the ontology, and epistemology, which in turn inform the methodology. Let's look at some examples.

Example 1: Realism + Positivism + Quantitative Methodology

- **Research Question:** What is the impact of a specific educational intervention on student test scores in mathematics?
- **Ontology:** Realism - Believing in a single, measurable reality helps in quantifying the impact.
- **Epistemology:** Positivism - Using empirical evidence to measure test scores.
- **Methodology:** Conduct a randomised controlled trial (RCT) with pre- and post-test measurements.

Example 2: Critical Realism + Post-positivism + Mixed Methods

- **Research Question:** How do socioeconomic factors influence academic achievement and student experiences in schools?
- **Ontology:** Critical Realism - Acknowledging a single reality influenced by social factors.
- **Epistemology:** Post-positivism - Recognising human influences on knowledge while aiming for objectivity.
- **Methodology:** Collect quantitative data (test scores, demographics) and qualitative data (interviews, focus groups).

Example 3: Critical Realism + Constructionism + Qualitative Methodology

- **Research Question:** How do teachers and students construct their identities in multicultural classrooms?
- **Ontology:** Critical Realism - Understanding reality influenced by social interactions.
- **Epistemology:** Constructionism - Focusing on how knowledge is constructed socially and culturally.
- **Methodology:** Conduct semi-structured interviews and participant observations.

Example 4: Relativism + Constructionism + Qualitative Methodology

- **Research Question:** How do cultural narratives shape the experiences of immigrants in urban communities?
 - **Ontology:** Relativism - Embracing multiple realities based on different cultural contexts.
 - **Epistemology:** Constructionism - Exploring how knowledge is shaped by social and cultural narratives.
 - **Methodology:** Conduct semi-structured interviews and ethnographic observations.
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Map Your Research Approach

Use this worksheet to apply the concepts to your own research to ensure alignment and coherence in your study design.

1. Research Question:

- What do you want to investigate?

2. Ontology: What view of reality will help you answer your research question?

- Realism: There is a single objective reality.
- Critical Realism: There is a single reality, but it is mediated by social conditions.
- Relativism: Reality is diverse and context bound.

3. Epistemology: How do you believe the knowledge can be acquired?

- Positivism: Through empirical, observable phenomena.
- Post-positivism: Recognising human influences on knowledge.
- Constructionism: Recognising that knowledge is socially constructed, with multiple realities influenced by historical and cultural contexts.

4. Methodology: What methods will you use to gather the data?

- Quantitative: E.g., surveys, experiments, statistical analysis.
- Mixed Methods: E.g., combining quantitative and qualitative approaches.
- Qualitative: E.g., interviews, focus groups, ethnography. ____
