# Experimental Design Critique and Enhancement Form

Objective: To improve the design of your experiment using AI tools for critical evaluation and enhancement.

Instructions:

1. After drafting your initial experiment design, use <u>*Perplexity*</u> to critique your design. The AI can suggest potential confounds, biases, or weaknesses, as well as possible improvements.

2. Answer each question below using *Perplexity* and check the responses against the literature to ensure they are correct or sensible.

3. Based on AI feedback and literature review, revise your experimental design to address identified issues. Discuss the strengths and limitations.

4. Add the points in **blue** below as attachment to your report!

### **1. Identify Potential Confounds**

Use *Perplexity* to list potential confounds in your experimental design. A confound is a variable that influences both the dependent variable and independent variable, causing a spurious association.

Example question for *Perplexity*: 'What are some potential confounds in my experimental design related to [your experiment topic]?'

Check the literature to verify if *Perplexity* 's response is accurate. Provide a short summary of your findings.

## 2. Discuss Randomization Strategies

Randomization is a critical part of experimental design to ensure that each participant has an equal chance of being assigned to any group, reducing bias. Example question for *Perplexity*: 'What randomization strategies can I use in my experiment to ensure unbiased results?'

Check the literature to confirm the appropriateness of these strategies. Summarize the relevant points from your literature review.

## 3. Decide on Design Type: Within-Subjects vs Between-Subjects

Choosing between a within-subjects or between-subjects design depends on the nature of your experiment and research question.

Examople question for *Perplexity*: 'Should I use a within-subjects or between-subjects design for my experiment? What are the advantages and disadvantages of each in my context?'

Compare *Perplexity*'s suggestions with insights from the literature. Explain your final choice based on this comparison.

## 4. Determine the Number of Trials and Duration

The number of trials and the duration of the experiment can impact the reliability and validity of your results.

Example question for *Perplexity*: 'How many trials should I conduct, and what should be the duration of each trial in my experiment?'

Verify *Perplexity* 's recommendations with the literature, focusing on methodological standards for similar experiments.

Document your decision-making process.

#### 5. Address Ethical Considerations and Informed Consent

Ethical considerations are crucial for any experiment involving human participants. Ensuring informed consent is a key ethical requirement. Example question for *Perplexity*: 'What ethical considerations should I be aware of in my experiment, and how can I ensure informed consent?'

Cross-check *Perplexity* 's advice with ethical guidelines and literature. Outline how you will address these ethical considerations in your experiment.

### 6. Revise Your Experimental Design

Based on the feedback from *Perplexity* and your literature review, revise your experimental design. Provide a summary of the changes you made and explain why these revisions will improve the robustness and scientific validity of your experiment.