

Template for a Laboratory Experiment Protocol

1. Change Record

This should be a list or table summarizing the main updates and changes embodied in each version of the protocol and (where appropriate), the reasons for these.

2. Background

- a) identify previous research on the topic
- b) define the main research question being addressed by this study and the associated hypothesis and null hypothesis
- c) identify any additional research questions that will be addressed along with the relevant hypotheses and null hypotheses

3. Design

- a) determine the independent and dependent variables
- b) identify any variables that will need to be controlled
- c) identify the population to be studied (e.g. practitioners, students, novices,...)
- d) describe how the participants will be selected (recruited)
- e) determine the form of the study (between-subject or within-subject)
- f) describe the objects of study and how these will be prepared (if necessary), for example how errors will be seeded in a class for a testing study etc.
- g) specify how the treatment will be allocated to participants, such as the randomization mechanism to be used
- h) describe how the protocol is to be reviewed (e.g. by supervisor, domain expert, etc.)

4. Data Preparation and Collection

- a) describe how the material for the study will be prepared
- b) define a data collection plan and how the dependent variable(s) will be measured
- c) define how the data will be stored

5. Analysis

- a) the plan should identify which data elements are used to address which research question and how the data elements will be combined to answer the question
- b) describe any statistical forms or graphical forms to be used
- c) assess the threats to validity (construct, internal, external)
- d) report any trials of the analysis process

6. Pilot Study

- a) Describe any trial of the experimental materials and/or process

7. Study Limitations

Specify residual validity issues including potential conflicts of interest (i.e. that are inherent in the problem, rather than arising from the plan).

8. Reporting

Identify target audience, ways of providing data (e.g. scatter plots)

9. Schedule

Give time estimates for all of the major steps