**« How to write an experimental protocol »**

**Let’s the doctoral students talk:** *« It is interesting because it allows you to question yourself on more advanced points. » ; « Good exercise to do at the beginning of your thesis. » ; « Allows to spotlight on the lack of personal information necessary to build a data collection protocol » (French translation)*

**When:** This document should accompany you as soon as the tools to be tested are created, when the data production methods have been chosen.

**Why:** It allows you to write the experimental protocol to produce data and to specify the measurements and the methods for data production and analysis.

**Inputs for thesis writing:**It is to be used to write the methodological parts of the thesis.



refers to tools developed for research (e.g. robot, capteurs, etc)

refers to experiences which involve users

**Objectives of the experimentation**

* Give a name to the experimentation (this provides a mnemonic way of remembering which experimentation it is, the location of the circumstances, tools that have been tested, the participants, etc.)

* Describe what this experimentation is goign to be used for.

**Contribution and tools involved in the experimentation**

* Identify the scientific contributions involved in the experimentation

* Indicate how the experimentation is going to make the scientific contribution evolve

* Indicate the status of the scientific contribution (to be developed, improved, evaluated, etc.)

**Questions or hypotheses and measures**

* Indicate the questions and/or hypotheses that will have to be answered during this experimentation.

* List the measures that will be taken during the experimentation: speed, performance, activites, expectations, needs, changes in practices, satisfaction, …

**If the purpose of the experimentation is to build or evaluate tools, description of the associated tools or components**

* List the associated tools that are concerned by this experimentation

* If there are any, list the components (parts of the tools) that will be concerned by this experimentation (the objective is to split the tool into components to identify the specific points to be built or evaluated)

* Indicate the status of these components: non-existent *(e.g. the tool does not yet exist, the participant will contribute to its design)*, digital *(e.g. digital platform, robot,...)* or static *(e.g. hard copy, book, ... )*

**If the experimentation involves humans, description of the participants in the experimentation** *(information to be taken from the decision tree guide)*

* Describe the profile of the participants in the experimentation

* Indicate why these participants are mobilized: to observe in real situations, to discuss with them, to quantify their practices, to make them confront ideas among themselves, etc.

* According to the measurements and data you wish to collect, what do you know about your participants? *(e.g. – I do not know their way of teaching chemistry, – I know very well their way of managing projects, – I do not know the habits of families in the use of home automation, – I have already made in situ observations, I know the practices of my users with the connected tools)*

* Indicate how the participant will be able to use tools or components during the experimentations

* What are the tasks that will be asked of the participants?

* How will you present these tasks to the participants?
* TIP 1: *A priori, the participants are not experts in your field, it is not necessary to present your scientific contribution to them.*
* TIP 2: *To answer this question, put yourself in the participant’s shoes. A priori, he has no knowledge of what he should test, you must clearly present the tool or component without revealing your hypotheses or questions*.

* What are the instructions you are going to give to your participants?

* Indicate the number of participants

* Indiquer the place of executing (in lab, in situ, …)

* Indicate whether users are consulted alone or in groups

* Recruitment: Indicate how user recruitment is done
* TIP 1: *Recruitment can be a long process, so think ahead*
* TIP 2: *Write a consent document*



**GDPR and ethics commitee**

* Indicate the steps to be taken with the GDPR for the processing of the data

* Indicate the steps to be taken with an ethics commitee to declare the experimentation

**Data production methods and tools**

**Data production tools** are used to collect data during an experimentation.



**Methods of data production**

* Using the flowchart (MATUI), indicate the data production methods you will use

**Existing data production tools**

* Indicate whether data production tools exist in the literature (e.g. spectrophotometer, scale, video headphones, sensors, etc), questionnaires, observation grids

* If yes, indicate which ones you will use with their sources and whether or not you will adapt them for your experimentation

**Tools for producing data to be produced**

* Indicate, if necessary, the data production tools that you will create

* List the experimental material to be constructed to perform the experimentation (e.g. sampling, data sets for a benchmark, presentation, questionnaire, etc. )

**Generated data**

* Indicate all the material and data produced during this executing *(files, diagram, audio, traces, etc.)*

* Describe the format of the traces to be produced of a digital tool is used

**Technical equipment**

* Indicate the technical equipment required for data capture *(e.g. densitometer, sensors, scale, camera, recorder, magnetic stirrer)*

**Data analysis tools**

* List the tools and methods thate are being considered for analyzing the data.

* Indicate the treatments to be carried out to validate the quality of the data

* Specify the data processing plan

**Planning**

* Indicate the big steps of the experimentation