Testing Guide

1 Objective

The objective of this test, is to evaluate our application, in terms of interface design, easy of use, efficiency, stimulation and understandable. This test also have the objective, to identify the biggest stress points of our application.

2 Research Question

With this experiment, we want to answer the following question:

- Did the user understand enjoy using our application?
- There where any stress points?
- If yes, did this stress points make the user give up?

3 Setup

In order to facilitate the distribution of the project, the thesis in online in my website. The only setup necessary for the user, is a device (computer is preferable due to the size of the screen) connected to the internet. During the use of the application, we collect the data of the user interaction.

At the start of the application, appears a pop-up asking asking for user consent to participate in our study. The application have a set of objectives, that guides the user throw the use of the application. In the end, a pop-up appears, asking for the user to answer a questionnaire. In this pop-up there will be an button that when clicked, a new tab is open in the browser with questionnaire. The questionnaire have an field that is automatically filled with the log file name, so we can connect the questionnaire with the data collected.

4 Procedure

The researchers will contact the potential users, throw social media (IST/LEIC/MEIC facebook group and by direct message to some friends) and subreddits related to game development, if they can test our application, if yes, we send the link of our WebGl application.

Since the museum, don't have a focus group i.e. they have visitors from all ages, genders and with different knowledge about the electromagnetism, any person can test our application. However, since our applications is currently in English, some knowledge of English is necessary.

When the user opens the link, our application is loaded, and after the user agree to participate in our test a pop-up appears explaining what is the object, and giving the first objective to accomplish. There is a set of objectives, that guides the user throw the application. This objectives are:

1. Generate an magnetic field by the electric coils
2. Create a line
3. Create a circumference smaller than the ampule radius
4. Create a circumference bigger than the ampule radius
5. Create a spiral
6. Create another spiral

This objectives where selected, since they cover everything that is possible to do in the real object. They also cover all the physics concepts that this objects allows us to study. The objectives can only by accomplished by this order.

After the final objective, a pop-up appears, thanking the user and asking them to user the questionnaire, there will be a button that opens immediately the questionnaire in a another browser tab.

5 Data collection

As said above, data will be collected in two forms. The user interaction data will be collected using our log system, that records the user interaction events (like clicks, drag-and-drops, keys pressed, etc.) in a server. In the questionnaires, we are going to user google forms, that automatically saves the data, and organizes them in charts.

The questionnaire is composed two three parts:

1. Demographic questions: Age, Genre and Academic qualifications
2. Questions about electromagnetism field concepts, and questions about Cathode Ray physics
3. Questions about the interaction with our application:
   (a) A set of questions from the EUQ questionnaire [1]
   (b) A set of questions about what the user thinks about our application and interface

[1] https://www.ueq-online.org/, Last accessed in 18/06/2020

6 Requirements

- **User:**
  - A device (computer is preferable) connected to the internet
  - Browser that allows to run WebGl.
  - Knowledge of English
- **Researcher:**
  - A device (computer is preferable) connected to the internet
  - Since both data are automatically saved in a server, the researcher, doesn't need to be track user test. i.e. he doesn't need to do anything until all the tests are done.

7 Data Analysis

To analyse the data, the first step is to remove all the log files and forms that are not connected. After that we are going to use the EUQ tools to analyse the answers given to the EUQ questions present in our form. Next, we are going to parse the log file, since the log files can contain information that is not relevant.

We are going to compare the answers of different demographics users. The log files, will help use, understanding the time spent and interaction between each objective completed. For example if the user spent a lot of time rotating the ampule and changing the intensity values until creates the line. With this, we can understand the stress points, and maybe allows to arrange an justification for the answers given in the second part of the questionnaire.

In the end we will have a set of charts and tables (time, user interaction) that will answer our research questions.