

Concept for the final project in the course ”Advanced Experiment Design in Unity”

Kristina Kobrock

June 2021

1 Introduction

The basis of this project will be the ”Minigolf” game we created for the beginners’ Unity course. The idea is to implement some extras, change the concept, improve our code and visuals and hand in a project that on the one hand builds on what we have done before, but on the other hand exceeds the first project in a number of ways.

In order to achieve this, we will change the experimental paradigm we included before, improve the world generation by using object pooling and add a character editor. We will also work on a more visually appealing game experience and on cleaning up and improving the efficiency of the code we have written before while including new ideas and playing around with the new things we learned in the advanced course. Here, I would like to fix the general concept, timeline and experimental framework for the project.

2 Timeline

1. start screen:

”Welcome to this game blabla”, click on [\[next\]](#) to proceed

2. character editor:

- (a) control group: ”This is the character you will play with. Enjoy!”, click on [\[next\]](#) to proceed
 - i. collect *time* in the background
- (b) experimental group: ”Please choose one of the characters to play with. Enjoy!” click on [\[next\]](#) to proceed
 - i. collect *time* and *items* in the background

3. game scene:

- usual minigolf game with (customized) character + fitting scenery

- display time (again 2 minutes?) and metres in the top right corner
- collect experimental data in the background (*metres, failures, levels*)
- proceed when time runs out

4. **feedback:**

“Great, you did it! Do you have time to answer some questions that help us further improve the game?” + *questionnaire* on gaming experience, click on [submit] / [no] to proceed

5. **end scene:**

“Thank you, your feedback was submitted! Do you want to play another round or quit the game?” / “Do you want to play another round or quit the game?”, click on [new round] to proceed to **start screen**, click on [quit] to **quit** the game

3 Experimental Framework

The next section will shed light on why we plan to collect certain data points.

Our idea is based on a study by Langer and Roding (1976) who found out that elderly people living in an elderly peoples’ home lead a happier and more active life when they are given responsibility for themselves. In order to measure this, they compared two groups: The experimental group was given (among other things) the decision to choose a plant to care for and the responsibility to care for the plant. People belonging to the control group, on the other hand, were given a plant and told that the plant will be cared for by the staff [1].

This study motivated us to focus on the question: **”When gamers are able to decide for a character to play with, does this influence overall *game experience* and *performance*?”** Here is how a study that investigates this question could be designed and which variables we should measure or control for:

independent variables:

- *decision*: control group is put into the character editor but cannot change anything, experimental group is actually able to edit the character

dependent variables:

- measuring **game experience**
 - *questionnaire* in the end (5-point scales and generic questions taken from some other study), not too many questions (maybe around 5)
- measuring **game performance**

- *metres* (with fixed speed and fixed time): number of metres achieved by the player, positively correlated with *performance*
- *failures*: number of times the character falls down from the lane or runs into an obstacle, negatively correlated with *performance*
- *levels*: in case the difficulty is increasing: How many ‘levels’ are played successfully?, positively correlated with *performance*
- **control**
 - *time*: time spend in character editor (for both groups)
 - *items*: different characters that were clicked on (for experimental group only)
 - *interactions*: total number of items clicked on (for experimental group only)
 - *gaming frequency*: for a real study it would also be nice to have a questionnaire to control for how much experience the participants have with gaming and how much time they spend with it, but not necessary here

4 Character Editor

We plan to include more characters than the minigolf ball and also change the game scenery accordingly in this version. For example:

- football
- basketball
- tennis ball
- watermelon
- cheese wheel

References

- [1] Langer, E. J., & Rodin, J. (1976). The effects of choice and enhanced personal responsibility for the aged: A field experiment in an institutional setting. *Journal of Personality and Social Psychology*, 34(2), 191–198. <https://doi.org/10.1037/0022-3514.34.2.191>.