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V-Label : an experiment on how Augmented Reality impacts memorization

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Abstract. This paper presents the V-Label experiment aiming at determining whether using an augmented reality helmet favors memorization. The helmet considered here is the Hololens from Microsoft.

Keywords : Augmented reality. Memorization. Helmets

1 Introduction

During 2016 many new devices were fully developed to enable the integration of virtual worlds or to enhance the real world, VR helmets (Virtual Reality) and AR helmets (Augmented Reality). Global Forecast [1] predicts a market with 79.77 billion by 2022, where 0.7 billion dollars are dedicated to education [2]. In this context, we purchased Microsoft's Hololens offering both AR and VR, and aimed at finding out if this device could favor memorization.

2 Memorization

Among the various learning theories, behaviorism has often considered the «Learning» process as a black box impossible to explore [3]. On the other hand, there are many study with VR that measure some specifics factors during the learning process like memorization which is relatively easy to produce and measure. [4, 5, 6] We questioned whether memorization is better supported with or without the use of AR devices [7]. Azuma [8] defines augmented reality as a device which « allows the user to see the real world, with virtual objects superimposed upon or composited with the real world». Superposition can both support and harm the learning process. Experiments conducted on ordinary digital devices show how paper enables a higher memorization rate [9]. We wish to explore if a similar phenomenon occurs with disruptive devices.

3 The VR-Label project

We were inspired by Franklin Roosevelt, famous for his infallible memory for names when meeting people. He used an idiosyncratic technique by virtually writing people's names on their forehead when introduced to them. Encoding information was thus stimulated, as well as setting the conditions for the cued-recall. The VR-Label

adfa, p. 1, 2011.

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project reproduces this mechanism. The subject wears the Hololens helmet. When someone mentions his name, he repeats it and the system can then display this name on a label placed above the person whose name must be memorized.

4 Experimentation

The prototype is ready. Very soon, we shall conduct an experiment among the HES-SO's students, to compare the rates of memorization between groups with and without devices. For this test, we chose a class of students in their 1st Bachelor year in Computing, and students in their 2nd Bachelor year in Economics (48 subjects). Before starting the experiment, the students will be drawn and the random selection split into 4 groups: (Group with the Hololens 1 (GAH-1), Group with Virtual Imagination 1 (GVI-1), Group with the Hololens 2 (GAH-2), Group withVirtual Imagination 2 (GVI-2)). The Virtual Imagination groups carry out the same experiment and are required to place an imaginary label above the people introduced to them. The protocol goes as follows:

- Information on the test and the Hololens,
- Splitting into groups and realization of the experiment,
- Once the experiment is completed, each student takes an exam, to count the number of persons remembered, the number of errors. For the experiment, the photos of all the students' faces will be displayed on a hard-paper document.

The results of this experiment will be presented in a future article.

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