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Multi-sensory storytelling to support learning for people with intellectual disability: an exploratory didactic study

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Abstract

In this paper we present a study about multi-sensory content within the context of learning activities aimed at people with intellectual disability. A story was prepared together with traditional stimulus (audio and visual) and multisensory (audio, video, tactile and smell). Knowing that people with intellectual disability, due to their cognitive limitation, have multiple learning difficulties, namely in areas such as: communication, reading/writing and attention [1], it is really important to create innovative and pedagogically effective solutions that may motivate them and assist their learning process. Therefore, this study presents Preliminary results showing an overall improvement regarding the participant's memory when using the very multi-sensory contents.

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1. Introduction

Disability is generally defined by CIF (International Classification of Functioning, Disability and Health), as “problems in the function or structure of the body, such as a significant deviation or loss” [1]. Intellectual disability, in particular, affects cognitive functions and its development over time, leading therefore to major learning difficulties which is one of its most recognized and prominent characteristics. Its origin may result from genetic

factors, environmental conditions, disease and injury during childhood, circumstances occurring during and after pregnancy as well as during the first years after birth [2]. Furthermore, this group of disability is closely associated with several pathologies in the intellectual development, dementia and mental and intellectual retardation [3].

As regards the teaching and learning contexts, there are in general, several tools thought of to support teaching. Some of its examples are provided by the area of information and communication technologies (ICT), such as PowerPoints, digital books, virtual schools, movies, and videos, among others. However, for people with intellectual disability this number tends to decrease. [4] In fact, attention and memory are cognitive functions that are affected by intellectual disability. Therefore, not only people with this disability tend to not pay attention to an activity but they also show not recalling what was previously done or practiced. From a didactic point of view, such learning limitations call for an adequate response so that people with intellectual disability may be provided with proper methodologies that allow them to experience higher levels of interest and motivation in a given activity and consequently lead them to better learning results.

To overcome this tendency we explore a didactic solution by means of very innovative multi-sensory contents to enhance learning. Therefore, if we add new sensory stimuli (such as smell and tactile) to the learning process we strongly believe we can increase memory, and consequently learning, as it is claimed by different studies, such as Brug *et al.* (2012) and Young *et al.* (2011). Indeed, according to these authors the stimulation of different senses help in retention of information and learning process.

In this paper we study how multisensory contents assist memory and help developing motivation skills within the learning process for people with this disability, register difficulties observed and results obtained.

This paper is structured by the background, where the main concepts (intellectual disability and multi-sensory contents) are exposed, followed by the case study and its description (methods, participants, experimental design, apparatus, procedures, results and discussion). Finally, it is presented the conclusions and future work.

2. Background

According to Alfassi & Hefziba (2009), the learning process is the same for both people without disability and people with intellectual disability [6]. The traditional didactic approaches and activities, such as reading and writing tasks in textbooks, movies, powerpoints presentations, oral and gestural exposition, acetates, among others, are the common methods used within the learning process [7]. These methods have been used throughout the years and because of the continuous practice of these methods, students in schools have increasingly shown discouragement [8]. Typically, only two senses are in fact stimulated: audio and visual. However, when it comes to effective learning, it's crucial to stimulate others [9].

The objective of multi-sensory content is to make users feel their own presence, stimulating all their senses with different purposes [10]. Thus, we have five senses: taste, audio, visual, smell and touch. These stimuli produce different reactions in each person, and this is because several factors influence these same reactions. In the group of people with intellectual disability, the cognitive skills are affected and reactions obtained before inserting stimulus become even more diversified [11].

In education, there have been efforts to incorporate the multi-sensory contents in storytelling. Storytelling can be a way to convey knowledge, entertainment and provides a social environment. In the United Kingdom, for example, storytelling began to be used, in schools, to develop social interaction of children [12].

An upgrade of Storytelling is Multi-sensory storytelling and it's being much used and practiced. Indeed, not only it is widely used in United Kingdom, but it has also been recently introduced in Netherlands and Belgium. Despite this success, there is little research on its content and efficacy [13]. Multi-sensory storytelling involves stories with the multi-sensory and oral text. The content and presentation should be created taking into consideration the (in) capacities of the group. During the presentation, it is normal to deliver an object (adding the tactile stimulus) to attract people's attention and motivate them to explore. Also, stories must be planned in order to facilitate the comprehension of people with intellectual disability. This multi-sensory content allows controlling the environment and provides the "feeling" that something will happen, letting people to get involved and attempt to anticipate the story. Consequently, it is very important to choose the stimuli presented and correctly prepare the local (room) where the story will be told so that nothing interferes with the experience. Several topics can be addressed in these multi-sensory activities depending on the purpose and the more are repeated the easier it is for people to understand and retain the information. This type of activity can raise participant's motivation. For people with intellectual

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