Chapter 6

Aura: Augmented Reality in Mobile Devices for the Learning of Children With ASD – Augmented Reality in the Learning of Children With Autism

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ABSTRACT

A person with autism or autism spectrum disorder (ASD) presents conditions characterized by challenges with social skills, repetitive behaviors, speech, and nonverbal communication. Augmented reality (AR) combines reality with virtual aspects such as sound, video, graphics, or GPS data. Specifically, Aura is a mobile augmented reality application applied in the learning of children with ASD with the purpose of helping them in their relationships with the outside world and especially in their learning. Aura consists of five modules and 42 activities. The modules are Learn Basic Shapes, Repeat Basic Habits, Draw, Learn to Write, and Learn Values and Empathy. This project was tested by children of the Angelitos Mios Foundation, located in Apizaco Tlaxcala. The test showed favorable results. Tests were conducted with students in the age range of 4-8 years with ASD. The foundation is currently working on the acquisition of mobile devices for the implementation of Aura.

DOI: 10.4018/978-1-5225-5243-7.ch006
INTRODUCTION

Autism is a complex neurological disorder that usually all the life stays. It is part of a group of disorders known as autism spectrum disorders Autism Spectrum Disorder (ASD) (Benito, 2016) and (García, 2004). The most recent statistics indicate that one in every 10,000 Mexicans live with ASD at different levels.

The scientific research that have been made in “unique case” groups have demonstrated the effectiveness of global interventions where children with autism learn skills through set of techniques based on applied behavior analysis. These techniques help people with autism adapt to their environment and have shown that they can increase their IQ by about 20 points (Rodríguez, 2017).

The purpose of the project is to be part of the methods used in the education of children with autism in a range of 4 to 8 years. The AURA project focuses on supporting the significant learning of these children, considering all the elements necessary for this, such as a well ordered space, application of significant graphic elements, and other aspects.

The importance of Aura and its relationship with Augmented Reality remains in the possibility of adding virtual information to the real world, allowing to enrich the user’s environment.

Throughout the project we have reviewed different works that other authors have done along with their respective contribution to autism, as well as the state of art that surrounds our research, which is reflected in the article. The Aura project and its evaluation are also presented.

BACKGROUND

Background of Augmented Reality

The Augmented Reality (AR) is a variation of Virtual Reality. Virtual Reality technologies wrap users in a completely synthetic environment, shifting the real world around them. Augmented Reality AR, however, allows the user to see the real world, in which virtual objects are superimposed, such as animations, 3D objects (Lara, 2004). Therefore, the Augmented Reality does not replace reality, but complements it (González, 2011). The Augmented Reality in mobile devices has a great impact, because it is very easy to work with this type of devices, giving way to great possibilities to generate Augmented Reality by relating images in real time, geographic position of the user, markers with information stored in the Fombona (Fombona, 2012). Platforms like Vuforia (Vuforia, 2017) currently allow us to implement AR with texture-based tracking (Markeless, 2013), which gives us more
Teachers and Mathematical Modeling: What Are the Challenges?
www.igi-global.com/chapter/teachers-and-mathematical-modeling/176996?camid=4v1a