Chapter 18
A Serious Game as an Auxiliary Tool for the Learning Process of Children With ASD

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ABSTRACT

This chapter presents the game K-Hunters, a serious game with the purposes of decreasing the isolation time and helping the learning process of children with autistic spectrum disorder (ASD). The game uses geolocation, virtual reality, and augmented reality techniques to provide an environment to hunt and capture virtual monsters, holders of knowledge. These monsters are geographically spread throughout the real world and can be associated to learning objects. Through mobile devices, the users can go out hunting the monsters, capture them, and view their learning object-related content. Thus, the users are encouraged to get out of their isolation, to search for the virtual monsters, to obtain knowledge, as well as being inserted in scenarios favorable to interpersonal interaction.

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INTRODUCTION

The Autism Spectrum Disorder (ASD) is a psychological condition that affects the life of several people around the world. Bleuler firstly used the Autism word in the year 1911, in order to describe the contact loss with the reality and the communication difficulty demonstrated by certain people (Ajuriahuerra, 1977). Léo Kanner (1943), an Austrian psychologist, was one of the pioneers to observe and study children with ASD, noting that they showed some common characteristics, such as inability to relate to others that resulted in isolation, communication disorders and obsessive worrying over immutable things. Gilbert (1990) states that autism is a behavioral syndrome that has different etiologies, that profoundly affects the child development process. According to Schwartzan (2011), the autism symptoms are evidenced through characteristics such as speech delay, lack of visual contact, stereotyped movements, social isolation, and excessive attachment to routines, among others. The causes and the cure for children and young people diagnosed with Autism Spectrum Disorder remain unknown. That phenomenon can occur to people of any social class, race or culture, and about 65% to 90% of the cases are associated to some mental disability (Gadia et al., 2004). It is believed, from statistical data, that there are sixty billion people worldwide with that condition (R7, 2016). A research conducted by the American government showed that the cases of autism increased to one in sixty eight children in the year 2010. The cases were mostly diagnosed in eight-year-old children. The research was assessed by the Center for Disease Control and Prevention of the United States (Paiva, 2014).

The individuals with Autism Spectrum Disorder (ASD) demonstrate behaviors directly related to the development of their social capabilities and communicative skills. Some aspects such as the lack of response from those individuals is a result, most of the times, of their lack of comprehension about what is being required from them (Bosa, 2002) and the isolation tendency that can impair their speech development (Camargo and Bosa, 2009) end up harming their learning process. Besides that, teachers and school environments indicate that the lack of appropriate orientation, structure and pedagogical resources difficult their teaching and learning process (Sant'ana, 2005). In that sense, the scholar inclusion of people with ASD is a highly relevant contemporary issue.

Studies show that children with ASD display improvements when they have the opportunity to interact with people of their same age group, encouraging them to stimulate their interactive capabilities, reducing their isolation (Camargo and Bosa, 2009). Even if children demonstrate certain difficulties while learning the curricular components, they can beneficiate from the social experiences that can happen in the classroom (Karagiannis, Stainback and Stainback, 1999). Beyond the large number of cases of children with autism worldwide, there are also the unpreparedness of some school institutions in using resources that favors the learning process of children with ASD. Jordan (2005) demonstrates the need of guidance for the teachers because their lack of knowledge about autism disorders results in failing to identify the needs of those students and, consequently, jeopardizes the learning process. Furthermore, Bosa (2006) states that children that shows a large communication deficit need alternative and special ways to communicate.

In order to fill the education and social gaps of those people, Valente (2011) suggests the use of information technology, asserting that technology is an alternative that can properly meet their needs. Passerino (2005) also points that the computational environments can be used to amplify the communication, language and autonomy, allowing exchanges between the subjects in a way that a knowledge is built and the cognitive and socio-affective dimensions are improved. Following that trend, digital games are being used in treatments to improve the development, increase the knowledge, and the cognitive and