Chapter 13
Gamified Virtual Environment and Interaction Design for Activities of Daily Living Training:
Beyond the Horizon of Assistive Technology

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ABSTRACT

Ludic games and gamification processes can extend functional skills in players as they integrate different intelligences and stimulate the cognitive, perceptual, and motor activities. Play can facilitate the work of occupational therapist since provides better cooperation of the patient, besides helping in its development, increasing its behavioral repertoire, mainly in the accomplishment of activities of daily living. This chapter addresses these issues, discussing the design of a gamified virtual environment that helps occupational therapists to develop the potential of children and adolescents with mild, moderate, and severe neuropsychomotor disorder. For that, the authors present an investigation of the use of a gamified virtual environment and interaction devices in the training of activities of daily living. As result, they note that games as assistive technology can encourage the integration of education, rehabilitation, and habilitation of people in situations of vulnerability and social risk, providing access and inclusion through playful and challenging activities.

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INTRODUCTION

The occupational therapist is the health professional who works with the development of people with some type of disability through the accomplishment of everyday activities. Among these activities, the occupational therapist uses the activities of daily living and the resources that the environment offers as working tools to help the person to acquire the potentialities, skills and attitudes necessary to reach the maximum of autonomy and social integration (Moyers, 1999).

Activities of daily living are personal tasks and other skills pertaining to people's daily living. According to Aranha (2005), activities of daily living comprise a set of activities that aim at personal and social development in the multiple tasks of daily living, in view of the independence, autonomy and social coexistence of people with some type of disability. The following are considered activities of daily living: (i) self-care, such as brushing teeth, combing hair, dressing, bathing, shoes, feeding, drinking water, using the toilet, among others; and daily tasks such as cooking, washing dishes, washing clothes, bedding, sweeping the house, ironing clothes, using the telephone, writing, manipulating books, sitting in bed, transferring from one place to another, among others.

According to Corrêa et al. (2016), training in activities of daily living should start as early as possible. This should be developed from the level of perceptual experience, meanings and conceptual level of the learner. At the preschool stage, activities of daily living should be developed associated with routines and analog games in order to establish permanent habits in the child. Activities of daily living techniques are important for the student to be stimulated to reach his independence, which, if achieved through an adequate program of activities, goes beyond basic personal needs and can foster the development of self-confidence, the valorization of one's own abilities, autonomy and global development. With appropriate intervention and family guidance, many difficulties can be overcome or overcome.

Occupational therapist examines the technical aspect of a number of elements, such as movements, skills, functions, required cognitive abilities, and emotions that can be produced and expressed. The relationships that involve the accomplishment of such activities are also analyzed, considering the therapeutic context and the daily living of the patient. Occupational therapy is performed based on functional assessment, which aims to describe skills and activities to measure individual performance in tasks required in daily life, vocational commitments, social interactions, leisure activities and other required behaviors (Granger & McNamara, 1984).

In order to stimulate the function and reduce the interference of the deficiency in the performance of functional activities independently, the occupational therapist employs assistive technology resources (Shuster, 1993). According to Schirmer et al. (2007), assistive technology proposes to solve with creativity functional problems in a perspective of developing human potentialities, valuing desires, skills, positive expectations and quality of life. However, Galvão Filho et al. (2009) point out that the fact that a technology is useful for the autonomy of the disabled is not enough to be called assistive technology, but rather whether this technology compensates or attenuates the consequences of barriers or deficiencies arising from a disability or reduced mobility. In this sense, gamified applications and digital and analogue games aimed at occupational therapist work can be considered as assistive technology resources, thus contributing to providing or expanding the functional abilities of people with disabilities and helping to promote an independent and inclusive life (Alves, 2006).

The authors Souza and Marino (2013), Grigolatto et al. (2008), Knox (2002) and Soares and Zamberlan [26] emphasize the role of play as an occupational therapist strategy of intervention in the performance components to be achieved by the child. Play can facilitate the work of health professionals because it