

Chapter 6

The Role of Gamification in Neurocognitive Rehabilitation

Artemisa Rocha Doreis

School of Health, Polytechnic of Porto, Portugal & Laboratory of Neuropsychophysiology, Faculty of Psychology and Education Sciences, Polytechnic of Porto, Portugal

Andreia Geraldo

Laboratory of Neuropsychophysiology, Faculty of Psychology and Education Sciences, Polytechnic of Porto, Portugal

Helena Martins

Lusófona University of Humanities and Technologies, Portugal

ABSTRACT

Neurocognitive rehabilitation continues to face difficult challenges related to patient and institutional characteristics. This reality requires innovative solutions to increase patient motivation and involvement in the process, turning rehabilitation more meaningful and pleasurable, as well as to help therapists overcome difficulties such as the absence of material and human resources. Innovative rehabilitation techniques have the potential to create motivating, personalized, and ecologically valid tasks. In this chapter, the authors describe the reality of neurocognitive rehabilitation in acquired brain injury and present the advantages and potential of digital information and communication technologies, especially serious games and gamification. Distinctive elements of these solutions and a reflection on the evolution of this area are presented. In order to establish evidence-based practices, it will be necessary demonstrate unequivocally the development of competences by the patients, supported by these new solutions, and its generalization to real-life activities in future research.

INTRODUCTION

The new digital information and communication technologies (ICTs) have changed the way we live and work and have contributed to countless opportunities in several areas, including healthcare (Entwistle & Newby, 2013; Mühleisen, 2018; WHO, 2005). In addition to the advantages already documented in

DOI: 10.4018/978-1-7998-7472-0.ch006

the literature, such as globalization, the narrow of cultural gaps and an easier, cheaper and wider form of communication (Mühleisen, 2018), the widespread use of digital ICTs has untapped potentialities; conversely safety, ethical standards, quality, and respect for the principles of confidentiality of information, privacy, equity, and equality are challenges that this kind of tools brings about (WHO, 2005).

Several concepts have been created to translate the application of digital ICTs to healthcare, including e-health. Although not consensual and with numerous meanings, the concept of e-health was defined by the World Health Organization (2005), at the 58th World Health Assembly, as "... the cost-effective and secure use of information and communications technologies in support of health and health-related fields, including health-care services, health surveillance, health literature, and health education, knowledge and research" (WHO, 2005, p. 212). At this same conference, a set of recommendations was made to the member states for e-health's proper development, implementation, and evaluation, enabling the dissemination of cost-effective models and evidence-based practices. As a result, new solutions that might support different sectors and health services have a new capacity for reaching populations that need them, including the more vulnerable groups such as migrants or refugees (Dores et al., 2017; Drda-Kühn et al., 2019).

People who suffered an acquired brain injury (ABI) are a vulnerable group. Although in recent years, ABI survival rate has increased, mainly because of the improvement of emergency services, survival is not always synonymous of a desirable quality of life, often compromised by emotional, cognitive, and behavioral changes (Dores et al., 2016; Menon & Bryant, 2019; Zasler & Martelli, 2003). In these cases, intervention should include neurocognitive rehabilitation as part of a more comprehensive neuropsychological rehabilitation process (Miotto et al., 2008; Zasler & Martelli, 2003).

Despite the evidence about the efficacy and effectiveness of neurocognitive rehabilitation (Cicerone et al., 2019; Geraldo et al., 2018), there is a long path to overcome limitations related to service providers and to the process itself, which is often long, slow, and associated with significant changes in patients' lives.

Integrating digital ICTs in neurocognitive rehabilitation processes has been shown to be an important asset. However, the great potential of digital ICTs remains to be explored, namely developing rehabilitation tasks closer to real-life activities, increasing their ecological validity and engagement capacity building (van der Ham et al., 2018).

Platforms, serious games, and virtual environments have been developed and made progressively available, with good results (Rego et al., 2018; Ma & Zheng, 2011). Boosted by the technological development and the widespread acceptance of gambling and gaming as recreational activities (Griffiths et al., 2012), gamification has emerged as a strategy capable of providing the necessary incentives to improve people's involvement in non-recreational activities, as the ones' proposed during rehabilitation process. Gamification has the potential to enhance characteristics such as perseverance, learning, optimism, and curiosity (McGonigal, 2014), through the increment of motivation related to the pleasure provided by game's experiences (Schell, 2010), thereby increasing the possibility of a successful intervention. Therapists may propose game-based experiences, without an enormous investment in technology.

This chapter proposes to reflect and deepen the knowledge about the use of serious games and gamification in the neurocognitive rehabilitation of ABI patients. We will begin by presenting an overview of the existent scientific evidence and knowledge of rehabilitation services and move towards the identification of challenges and future paths. A section with solutions and recommendations on how to possible overcome the problems previously identified is also included. A section with solutions and recommendations on how to possible overcome the problems previously identified is also included.

18 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

www.igi-global.com/chapter/the-role-of-gamification-in-neurocognitive-rehabilitation/269855

Related Content

Virtual Restorative Environments: Preliminary Studies in Scene, Sound and Smell

James F. Knight, Robert J. Stone and Cheng Qian (2012). *International Journal of Gaming and Computer-Mediated Simulations* (pp. 73-91).

www.irma-international.org/article/virtual-restorative-environments/74795

Adaptive Interactive Narrative Model to Teach Ethics

Rania Hodhod, Daniel Kudenko and Paul Cairns (2010). *International Journal of Gaming and Computer-Mediated Simulations* (pp. 1-15).

www.irma-international.org/article/adaptive-interactive-narrative-model-teach/47202

She Designs Therefore She Is?: Evolving Understandings of Video Game Design

Carolyn Michelle Cunningham (2016). *Examining the Evolution of Gaming and Its Impact on Social, Cultural, and Political Perspectives* (pp. 147-169).

www.irma-international.org/chapter/she-designs-therefore-she-is/157620

Designing a Generic Educational Game Shell

Louise Sauv   (2010). *Educational Gameplay and Simulation Environments: Case Studies and Lessons Learned* (pp. 366-389).

www.irma-international.org/chapter/designing-generic-educational-game-shell/40893

Issues and Concerns of K-12 Educators on 3-D Multi-User Virtual Environments in Formal Classroom Settings

Greg Jones and Scott J. Warren (2011). *International Journal of Gaming and Computer-Mediated Simulations* (pp. 1-12).

www.irma-international.org/article/issues-concerns-educators-multi-user/53150