

# Book review

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The book *Serious Game in Rehabilitation*, by Bruno Bonnechere tackles a trendy and important topic. This book has two major contributions. First, it provides a substantial review of the field that defines the context of serious games applied to physical rehabilitation. The second main contribution is that the author covers both positive and negative lines of enquiry about issues of using serious games; while remaining as neutral and objective as possible. This provides the readers the freedom to explore and consider the notion of using serious games in physical rehabilitation. Indeed, much of the richness of this book is that it has been written in a way that everyone, no matter their respective background, can find points of interest.

To start with, the author has put a great effort in an introduction that is extended over three chapters. First, the author started with a clear and short presentation of the technologies that exist in the world of video games.

The second chapter focuses on several stakeholders involved in physical rehabilitation, while also spending time to contextualise the importance of rehabilitation with the possible issues that patients may encounter. Finally, the author opens an interesting debate by discussing the pros and cons of serious games; which in turn provides the readers freedom to make and inform their own opinion on the topic.

Although each of these three introductory chapters tackles a concrete and independent theme, I think that the reading flow would be improved by starting with physical rehabilitation (chapter 2), followed by technology (chapter 1) and finishing with the debate on gaming (chapter 3). Indeed, the chapter on technology refers to technology

for games and not for physical rehabilitation. Thus, chapters 1 and 3 are connected while chapter 2 is independent. Consequently, chapter 2 on Physical Rehabilitation should appear first and not between technology and games.

In chapter 4, the author provides an extensive and detailed overview of literature related to serious games applied to different physical and cognitive conditions. The structure of this chapter is very clear and it gives a good overview of the potential of serious games in rehabilitation. However, the literature reviewed/included is limited to work up to and including 2015 and as such does not cover many studies that use more recent innovations such as the Microsoft Kinect movement sensor. Although the production of this device has been stopped recently, activities developed with this gaming device have greatly expanded since 2015. Thus, the book does not provide detailed information or data on the potential of the activities developed with full body recognition over the ones with only upper-limbs gesture recognition (like the Wii) or overall balance (like the Wii balance board). As a result, this book's discussion of the use of gaming technologies within physical rehabilitation is relatively limited in this regard.

Chapter 5 introduces very well the needs and the role that serious games can have in clinical use. The author places an emphasis on the lack of validation and, thus, proposes an example of a possible standard to validate the use of serious game in clinics. This sixth chapter is of great importance to researchers and practitioners in the field. The author proposes as standard the methodology used from an extensive study that includes six serious games. The methodology is thoroughly detailed from the design of the evaluation study (number of sessions, participants and interventions) to the validation and interpretation of the results (tests and statistical analysis). However, the chapter does not provide the data necessary to validate the proposed methodology. Indeed, no results are presented.

## Serious Games in Physical Rehabilitation

Unfortunately, the results are primordial in guiding the judgement of the readers on whether the process is valid and can lead to significant improvements. In section 6.2.6, the author suggests that evaluation is on-going with this work.

The last chapter is very relevant since it provides arguments surrounding issues and limitations of the use of serious games. I especially appreciate that the author covers aspects of people's state of mind. Indeed, the author explains that the negative connotation of gaming is still very present in people's mind, which hinders the general acceptance of games being reliable tools for interventions. This book provides good insights to the potential of serious games, and hopefully this will help people who still need convincing about the use of games as therapeutic tools. In any case, I do agree with the author that research in the field still lacks clinical validation, especially in the longer term. I also liked the fact that the author promoted the development of companies in this field. Indeed, the author clearly explained the advantages of custom games over commercial ones such as their ability to be personalised to the specific needs of patients. I do agree on that point, but my experience

also tells me that commercial games usually have longer and a better narrative with more content, which in turn allows the player to remain entertained and motivated in the longer term (better gameplay).

Overall, the book contributes to the field by providing detailed and easy-to-read knowledge about several cognitive and physical conditions that can benefit from physical therapies, including information on the disability, the current treatments and the existing studies that used serious games. This book is also relevant for practitioners, as it provides a good overview of the applicability of serious games. It also provides case studies related to positive outcomes of their application, and thus, it should promote their use in a future. Finally, the author tries to propose a standard of validation for researchers in the field. Unfortunately, this corresponding chapter lacks of relevant data that could validate the proposed methodology.

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