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Data Article

Design and implementation of a Serious Game on neurorehabilitation: Data on modifications of functionalities along implementation releases

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ABSTRACT

The measurement of users' perception of functionalities in the use of Serious Games (SGs) along technology implementation phases may lead to effective changes for developing successful user-centered learning tools in the medical field. In the present data article, data about usability functionalities along two cycles of validation of a SG on neurorehabilitation with final users are described. The key principles of usability model used to collect and analyze data and the evaluation tool are presented. The modifications of the SG to improve usability across implementation phases are detailed. The validation of the SG is described in "Engaged in learning neurorehabilitation: development and validation of a serious game with user-centered design" (Savazzi et al., in press) [1]. The data provided in this article will assist researchers working for developing learning technology to optimize their tools in relation to users' needs and expectations.

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Specifications Table

Subject area	*Psychology*
More specific subject area	*Serious Game implementation for education*
Type of data	*Table, text file, figure*
How data was acquired	*Ad hoc-questionnaire*
Data format	*Analyzed*
Experimental factors	*No pretreatment of samples was conducted*
Experimental features	*Application of the User Centered Design model for the implementation of serious game usability along implementation phases through an ad-hoc questionnaire*
Data source location	*Milan, Italy*
Data accessibility	*Data are with this article*

Value of the data

- *The data on Serious Game (SG) functionalities could be compared to data on other SGs developed with the User Centered Design model for further insight on SG implementation*
- *The data could serve as a benchmark for other researchers to assess the functionalities of an educational SG for improving usability*
- *The data could be used in the development of further experiments on development and validation of SGs*

1. Data

Serious Games (SGs) are technological tools with substantial effectiveness in learning. The present article reports data of the validation of a Serious Game (SG) on neurorehabilitation along two steps of implementation following the User Centered Design (UCD) model. In particular, the usability principles guiding the SG implementation, the tool adopted to collect data and the data obtained are described.

2. Experimental design, materials and methods

2.1. Procedure

We adopted a User Centered Design model to validate a neurorehabilitation-focused SG in order to monitor its usability and functionality along implementation phases. In particular, two cycles of *design-evaluation-redesign* were performed in which data on users experience provided informative feedback to make changes in the SG strictly related to users' needs. In particular, data were collected and analyzed to reach a good level of SG usability. Accordingly, an adaptation of the Nielsen–Shneiderman usability principles [2] guided the modifications for SG implementation. Table 1 reports and briefly describes the Nielsen–Shneiderman usability principles [3,4].

2.2. Participants

In order to verify whether the key core usability principles (Table 1) were being followed during SG implementation, two groups of physiotherapists ($N = 10$; $N = 28$) experienced the tool in two different steps of development of the SG.

Ethical Committee of Don Gnocchi Foundation of Milan approved the data collection and all subjects involved received the information sheet and signed the written informed consent.

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