Preliminary Analysis of a Virtual Inter-University Game to Learn Radiology within the Second Life® Environment †

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Abstract: A competition-based game, named League of Rays (LOR), designed to learn radiology within the multi-user virtual environment Second Life was adapted for the participation of teams of four students. The game ran from 20 February to 1 April 2020. Forty-one teams from 16 universities initially signed up and 28 teams from 14 universities finished the game. Participants found this activity fun, enjoyable and useful for their training. Some interesting proposals to be included in future editions of the game and interesting comments on the meaning of developing half of the game during the confinement caused by the Covid-19 pandemic were provided from participants.

Keywords: online learning; virtual worlds; gamification; game-based learning; medical students; undergraduate education; radiology

1. Introduction

In 2015, a virtual game called League of Rays (LOR) was designed to learn radiology in the multi-user immersive environment of Second Life® [1]. After several editions of individual participation, it was considered to replicate the game with students from different medical schools, taking advantage of the remote and free use of Second Life®, adding a “sense of belonging” and social comparison to the competition [2]. In 2019, the rules for participating in teams of four students were developed and in 2020 an edition with interuniversity teams was carried out, with the only requirement that participants were coursing a course on radiology this year. The goal of this study is to carry out a preliminary analysis of this last edition of LOR.

2. Materials and Methods

The game was organized in six weeks, the first three were dedicated to radiological anatomy and the latter three to radiological semiology. Participants had to register in Second Life, make an avatar and interact with the environment of the island, performing the actions required by the game (Figure 1). During the first four days of each week, participants had to view educational content presented in sets of three panels, as self-guided slide shows. On the last three days, the participants had to solve individual assessments (multiple choice test) and a team assessment related to the theme of the week. The score acquired for each team determined their position in the classification of participants. If one of the teams stopped participating for two consecutive weeks, it was disqualified. The organization of the game was in constant contact with participants by email. After the game, participants were asked to complete a questionnaire evaluating the project.
Figure 1. Several screenshots of the 2020 edition of the game League of Rays: (a) students watching educational content presented in sets of three panels; (b) a group of participants in front of the panel with the multiple-choice test corresponding to one of them. (c) Students doing an individual assessment on floating platforms in the sky; (d) several participants reviewing the assessment tasks by team.

3. Results

The game ran from 20 February to 1 April 2020, so the second half of it took place during confinement due to the Covid-19 pandemic. Forty-one teams from 16 universities initially signed up and 28 teams from 14 universities finished the game. The questionnaire was completed by 93 participants (83.0% of those who completed the game). The results are summarized in Figure 2. The students rated with average scores greater than or equal to 8.2 points out of 10, highlighting the organization of the project, the teacher, the usefulness of their information and interaction with peers (average scores greater than 9).

Figure 2. Bar graph depicting the mean rating of various aspects of the League of Rays game scored on a scale of 0 to 10. Error bars represent standard deviation. N or P means normal or pathological.
4. Discussion

The Second Life® virtual platform can be accessed free of charge and the learning opportunities it offers are almost endless, allowing communication, meeting and contact between different professionals in a synchronic and asynchronous way. LOR is intended as an asynchronous game-based learning approach. Since its first edition in 2015, it has proven to be a well-accepted game-based learning experience for students, which allows learning basic aspects of radiological anatomy and semiology in a very motivating way, providing a complementary tool to engage students in radiology learning [1]. The last 2020 edition also encourages teamwork and competitive pressure as a stimulus to establish radiology concepts and skills. The call can be considered very satisfactory, since 112 students from 14 different universities finally completed the activity.

Students increase their engagement and participation in their education through game-based learning and virtual worlds [3,4]. Current medical students, belonging to Generation Z, may find game-based learning activities, such as LOR, particularly attractive for learning because they are active problem solvers, independent learners and appreciate healthy competition [5]. This activity, developed as a multi-user online game, has been fun, enjoyable and useful for their training. Participants provided interesting proposals to be included in future editions of the game and interesting comments on the meaning of developing half of the game during the confinement by the Covid-19 pandemic.

Supplementary Materials: A PDF with information about the LOR 2020 prior to the start of the game is available online at http://www.biznaga.org/LOR2020/LOR2020.pdf. The last qualification of the game is available online at http://www.biznaga.org/LOR2020/LOR2020-37-SEXTA-calcificacion-general-ord.pdf.

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