Reflections about Learning Radiology inside the Multi-User Immersive Environment Second Life® during Confinement by Covid-19 [†]

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Abstract: The multi-user immersive virtual environment Second Life® has been used to teach radiology to third-year medical students during confinement due to the current Covid-19 pandemic. In general, the students, who are digital natives nowadays, have found it easy to adapt to the use of the 3D platform. Although there have been some technical limitations, both students and teachers involved have rated the use of Second Life® during the confinement very highly.

Keywords: online learning; virtual worlds; medical students; undergraduate education; radiology

1. Introduction

The state of alarm decreed in Spain by Covid-19 determined that, as of 14 March 2020, the face-to-face activities at the university would be suspended and replaced by online training. In the Radiology core course of the third year of medical studies at the University of Malaga, the virtual immersive multi-user environment, Second Life®, has been used. The aim of this work is to reflect on the advantages, disadvantages and other peculiarities of this virtual platform in this exceptional situation.

2. Material and Methods

The following activities have been performed in Second Life® during the confinement: (i) 72 two-hour seminars for groups of 23–25 people, keeping the planned schedule and involving 8 teachers; (ii) 9 one-hour conferences with guest teachers; (iii) a virtual learning game, during 6 weeks, competing with students from other universities; (iv) an option to take the final oral practical exam. Several surveys have been performed with students and teachers about the ease of access to Second Life®, the cognitive load that they had to handle within the 3D environment or about the perception of the different activities carried out.

3. Results

There were 220 students enrolled in the Radiology course, 176 first-time students and 44 repeating students. The seminars were held in Second Life® by 157 students (71.4%), with 48 sporadic absences (0.4%) for various reasons. Forty-six first-time students (26.1%) voluntarily participated in the inter-university game. Fifty-four students attended the conferences given by guest professors. Sixteen students accepted to take the online oral exam in Second Life®. Five of the eight teachers of the subject and eight of the nine invited speakers had never used this platform as a teaching tool.

Eleven percent of students stated that their access to Second Life® was difficult or impossible. Table 1 and Figure 1 show some results from a survey about the seminars held in Second Life®.

Table 1. Evaluation of the radiology seminars given in Second Life®.

Assessed Item	Scores ¹
Connectivity to Second Life®	9.40 ± 1.06
The island environment and classrooms in Second Life®	9.43 ± 1.06
Audio quality in Second Life®	9.41 ± 1.00
The experience receiving seminars in Second Life®	9.52 ± 0.87
Teachers in Second Life®	9.30 ± 1.04
Interest in the content for third-year medical students	9.34 ± 0.93

¹ Sample: 84 out of 90 students answered these items. Data are mean ± standard deviation of scoring from 0 to 10 points.

Figure 1. Bar chart of the percentages of answers in a 5-point Likert scale related to questions about radiology seminars held in Second Life®. Sample: 90 students (41% enrolled in the course).

4. Discussion

Second Life® is not a new educational resource in the subject of Radiology, as it has been used since the 2011–12 academic year without interruption [1–5]. This has allowed the virtual environment to be prepared for use in this critical situation. In fact, both the conferences with guest professors and the inter-university competitive game were activities scheduled before the state of alarm. These projects and the 3D platform were explained to all students at the beginning of the course, on February 14th. A month later, students suddenly found themselves in a situation of uncertainty, confined to their homes, not knowing how their training would be resolved. The practical seminars, which are essential in this subject, allowed for synchronous contact with their teachers, maintaining the scheduled calendar and providing a situation of linkage and continuity with the academic activity. The seminars with guest professors and the competitive game have provided complementary training options. The evaluation, which was usually done orally, has allowed Second Life® to be offered as a synchronous examination platform.

4.1. Benefits of Using Second Life to Teach during the Confinement

- Ease of adaptation for current medical students (Generation Z) to interactive 3D platforms [6] facilitates the willingness to use Second Life®.

- The feeling of being present in the classroom, sitting next to classmates, is greater than in other 2D environments and helps to connect with teaching activity made impossible by confinement.
- Second Life® is a fun environment, emulating a role play between students and teachers, and served as a distraction to break the monotony of confinement.
- It facilitates student–teacher interaction, especially when personal contact is not possible.
- It also helps maintain peer relationships (it has been especially interesting in the learning game).
- It allows for the incorporation of permanent educative content to be used asynchronously 24/7.

4.2. Drawbacks

- Technical limitations due to low central processing unit (CPU), graphics card, or internet connection capacity may impede access to Second Life® or cause defects in the virtual world rendering.
- When the quality of the audio (voice input/output) of a user is limited, it hinders the correct development of synchronous activities. This becomes crucial when it happens to the teacher.
- Sometimes it is difficult to display web-based slideshows, especially when there are many interactions on the displaying screen. This may be minimized with proper pre-training.
- The limit of attendees to avoid access problems is around 45 avatars synchronously in the same place. This prevents large group lectures from being taught with Second Life®.

Although there have been some technical limitations, both students and teachers involved have rated the use of Second Life® during the confinement very highly.

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