

Exploring the Social Presence in 3D Virtual Learning Environments

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Abstract: Multiuser virtual environments facilitate the design of learning methods based on immersive and collaborative scenarios. In these environments, the concept of social presence, based on the social and emotional projection of every user within the virtual learning environment, can have a positive impact on learning. Therefore, the aim of this paper is to analyse the users' social presence in a virtual world experience with 52 undergraduate students of Pedagogy, where they developed a series of activities related to a case study framed for their future careers. Our results show the development of a clear positive social presence in the three main categories: emotional expression, open communication and group cohesion.

Keywords: Social Presence, 3D Virtual Learning Environments, Learning Scenarios, MUVE

1. Learning scenarios in 3D VLE

The scenarios design is a methodology that allows projecting contextualized situations in a concrete social-technical space built taking into account different criteria that was given a priori. Each action that happens in a 3D multiuser virtual environment (MUVE) is technologically mediated. This fact introduces the following analytic dimensions (Domínguez, 2011):

- Social actors' diversity: the possibility of interacting within the 3D environment, with their peers, with the environment and with automaton or smart agents objects.
- Embodiment: this slope allows ways of human sociability where both the physical contact and the body presence are not necessarily needed.
- Information/action persistence: data outlives the program execution that created it.
- Platform for the social practice: A virtual world does not just contain objects that must be interpreted; it also builds a space, which mediates the social interaction among the individuals.

In view of this features, the design of learning scenarios has regard to the four dimensions included in this approach based on the "theatrical metaphor" that develops (Tu, Blocher & Roberts, 2008):

- Cognitive / scripts: We need to structure the training process to help students develop meaningful learning processes immediately and to be able to develop these mental processes in a social way. Not only do they have an identity and a role, but the teachers also do.
- Social / actors: The avatars allow us to help students define their digital identity and assume a role within the virtual world, taking into account the development of the overall educational process. Teachers also must create their digital identity and assume the corresponding role in this world that represents the training environment (Dwyer, Hiltz & Passerini, 2007; Tu et al., 2008). In the same way, they must create standards of operation and patterns of behaviour that help ensure the success of the teaching-learning process.
- Networking / stages: The same communication tools that virtual world offers help create a suitable climate for communicating with others at a time that both teachers and students, will implement the various roles that the actors (avatars) have taken during this training process and in this 3D environment (Boyd & Ellison, 2007; Jin, 2010).
- Integration / acting: The educational process is basically the interaction among the students that takes place in a social environment.

2. Social Presence

The notion of presence goes beyond the virtual environments. It relates to the feeling of being in a concrete place, thanks to the virtual environment immersion. According to Sheridan (1992), there are three measurable physical variables that determine presence: an extent of sensory information, control of the sensors relative to

the environment and, ability to modify the physical environment. However, this feeling extends when other users are perceived, this refers to the sense of being with others and the mode of being with others. Social presence was defined in terms of affective expression, open communication and group cohesion.

3. The Project

The SimuL@B (Simulation Laboratory) is a virtual world based on OpenSim and we slightly reprogrammed some basic Sloodle objects so they could be used in OpenSim. In this laboratory, the students use an avatar to explore the virtual world and to carry out the proposed activities to develop their digital competence. The platform is currently in beta version while being tested by the students.

The Degree in Pedagogy provides different training programmes that allow students to work in different educational fields, as it claims to train professionals in the personal, the professional, the social and the cultural processes that all occur together at a time. In this sense, the didactical proposal has two modules:

This first part of the project involves a reasoned reflection on their professional future and define the tasks proposed by them. In groups of 3-5 people, they are expected to reflect on the possibility of developing two educational products in three different areas (formal, non-formal or informal).

In the second one, each group has to choose one educational proposal and they have to develop their proposal in an island inside the virtual world.

The design, the development and the evaluation of education programs are found in the following fields: Business organizations' training, Editorial enterprise, ICT and media, Health, Environment, and Direction and management of public services.

At the end, the student has to deliver a personal journal of the project.

4. Methods and procedures

During the implementation of the projects, the main research data source was based on the structured diary notes that the participants were building up. After reading these diary notes thoroughly, we identify the components defined by Garrison (2007) about the social presence of the student when it comes to using the 3D environment, also detailed in previous headings. The evaluation criteria of social presence that has been used are:

- Negative: I hardly feel there are other students
- Positive: I recognize that there are other students in the virtual environment
- In reference to the group: My peers see me in the virtual environment

In these diary notes, the course professor requests the students to reflexively detail its own experience and to present a paper to the same professor when the experience is over. The design of the diary notes and its structure took into account Yee (2006) experiences that are related to the social interaction about the motivation in 3D environments. In our case, everything was structured in six sections:

- Avatar. Avatar personalization in the MUVE.
- Initiative. Decision making about the project execution.
- Collaboration. Motivation of the students for team working.
- Competition. Motivation of the students in reference to show their abilities in front of their peers and to progress.
- Autonomy. Autonomous MUVE use and the performing tasks.
- Escapism. Use the virtual environment for avoiding the real-life stress or, on the contrary, taking it as a compulsory activity in the course.
- Others. A space to discuss freely about the experience.

In reference to documentary analysis of the diary notes, McKerlich and Anderson (2007) research was taken into account. The authors define some specific indicators of virtual environments for each social presence category (emotional expression, open communication, group cohesion), in order to allow us to code each fragment that might need to be analysed as we see at the table 1.

Table 1: Items and indicators to observe

| Item | Indicator |
|---------------|--|
| Competition | Challenge / provoke others |
| Initiative | Decision making / follow instructions |
| Collaboration | Find / give support to the other students |
| Autonomy | They are dependent of the other students to accomplish the task |
| Avatar | Personalize the avatar appearance |
| Escapism | Use the virtual environment for disconnecting / feels obligated to use the virtual environment |
| Achievement | Task achievement |
| Social | Social information |

5. Results

In the first instance, we analyse generally the social presence (SP) from the analysis of the data collected in the diary notes. On one hand, we highlight that we have not obtained any evidence of SP with negative references, so every student mentions that they are in the virtual environments with their peers. On the other hand, we observe plenty of positive evidence of social presence, as a student states, related to the component of teamwork, “I saw a student of another group, so I realized it was not our island” (A4G2).

Secondly, we can observe a clear gradual evolution of the SP feeling between the beginning and the final experience, as it is stated in the diary notes of one of our students. In those notes (A1G7), for instance, in the first reflections we find expressions of negative emotions related to the avatar (“It’s hard for me to go in to the world but I find its way in the end. I waste a lot of time trying to edit my avatar”). Further, in the process, we appreciate that the motivation increases (“I start motivated, I have been thinking about new designs all night long [avatar related]. I am getting used to it and every time it takes me less time to do whatever I imagine”). In the final reflections of the diary notes, we find more data related to the realized work and not that much about the avatar appearance (“I add a map in the world in order to make the others locate themselves”).

The table 2 briefly details some of the most representative examples of the different slopes of the social presence documented on the students’ diary notes. These evidences are split into three parts: component of social presence, detected observation item in that category and frequency.

Table 2: social presence frequencies

| Component | Item | Frequency |
|----------------------|---------------|-----------|
| Affective expression | Competition | 0 |
| | Initiative | 5% |
| | Collaboration | 9% |
| | Autonomy | 0 |
| | Avatar | 59% |
| | Escapism | 12% |
| | Achievement | 0 |
| | Social | 15 |
| Open communication | Competition | 0 |
| | Initiative | 0 |
| | Collaboration | 5% |
| | Autonomy | 25% |
| | Avatar | 5% |
| | Escapism | 30% |
| | Achievement | 25% |
| | Social | 10 % |
| Group cohesion | Competition | 5% |
| | Initiative | 33% |
| | Collaboration | 10% |
| | Autonomy | 15% |
| | Avatar | 0 |
| | Escapism | 0 |
| | Achievement | 12% |
| | Social | 25% |

6. Conclusion

Virtual worlds are a versatile tool with applications beyond educational uses, as they contribute to the socialisation as well. The data analysis of this experience gives us information about the social presence, the

construction of identity and allows us to reflect on the possible advantages of learning in these 3D environments.

It is worth noting that the categories of social presence are detected the following components:

- Affective expression: It specially appears when the students refer to the appearance of the avatar and building resources. We found positive indicators of pride and fun.
- Open communication: The real world is little mentioned. The found references to it are about evasion or disconnection from the real world or representation of reality.
- Cohesion Group: No competition has been observed among the group members or between different team groups. It is observed that they help each other and collaborate altogether. The initiative is also detected both in the sense of making decisions as to ask for help.

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