Chapter 26

Popularization of Science in 3D Virtual Environments With “Scienza on the Road”

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ABSTRACT

Online virtual worlds, i.e., digital territories where people can interact with each other and with elements of their environment via their avatars, offer a great potential for communication, training and teaching. In this chapter, the author focuses on the popularization of science. The virtual world considered here is Second Life. Besides the mentioned characteristics, the avatar users can digitize elements of their environment, creating grounds, seas, animals, plants and many facts, school buildings, museums and coliseums. Thus, it is possible to make instruments for communicating and teaching like slide beamers, multi-channel monitors and lab tools, but also to geometrically illustrate formulas, take objects to pieces, build hyper-solids and animate physics interactions of sub-nuclear particles. The author describes best practices in the popularization of science implemented in Second Life within the Italian communities of the non-profit groups “Second Physics” and “Immersive_2Life” as designed and managed in the “Scienza on the road” project.

INTRODUCTION

This chapter aims at offering a more practical than technical reference to those who are interested in activities of scientific communication, science popularization or scientific outreach in Second Life or in a similar environment.

Virtual worlds are becoming more and more important in educational methodology and technology. Second Life is certainly the most interesting virtual world for developing educational, cultural and scientific activities. This chapter will present and discuss a series of best practices in a project of scientific divulgation aimed at stimulating the interest for science and more particularly for physics, of a lay audience. This Scienza on the road project was created by users’ communities Second Physics
and Immersiva_2Life within Second Life, the synthetic world conceived by physicist Philip Rosedale towards developing a virtual environment built by its own users.

The phrase “Public understanding of science” indicates all studies about perceptions and attitudes held towards science by the lay audience. The same phrase is often inappropriately used to cover initiatives aimed at inciting interest for science or curiosity about specific scientific subjects or institutions. Sometimes such initiatives are erroneously associated with “Public communication of science”, which actually means the branch that studies, and offers processes of, communication between experts and lay persons in scientific matters, for instance between scientists and journalists, or between scientists and politicians. In this chapter, the phrases “popularization of science” or “outreach of science” (a subset of the former, sharing its goals, but with a different approach) to indicate initiatives aimed at furthering science knowledge for a lay audience.

Popularization of science belongs methodologically to teaching activities and shares many similarities in the field of informal scientific or technological education. While their basic elements and operational modes are the same, their goals differ. Both use the same communication tools: lectures, seminars, thematic discussions, conferences, experimental labs, info-graphics, posters, books, booklets, layers. Formal education obviously aims at professionally training experts in scientific fields, whereas popularization of science and its outreach activities are geared to spread a general scientific culture among a lay audience: the aim is not to train scientists or technicians but rather to further knowledge of science and inform people about the most recent discoveries and their importance.

Another difference concerns the audience targeted in those two activities.

Formal education paths is meant for students, gathered in learning groups of people sharing similar characteristics of age and former preparation: classes. The training process must be completed within a given time and its success can be quantified by reaching a diploma that certifies the specific competence acquired by the learner.

On the other hand popularization of science targets a generic audience of broad age range, social and cultural backgrounds and does not have deadlines, except for those set by each user. Its success should be measured by the growth of scientific knowledge in the reached communities, which is very difficult to assess, especially within a reasonable time. More concretely, the success of a outreach program can be assessed by its proselytism through a user retaining rate.

Due to these differences, training activities that use virtual reality (VR) tend to be implemented in custom-built virtual environments for one or several learning subjects which can only be accessed by the involved teachers and students. They are often virtual transpositions of a single class where participants, gathered and selected in the real world, create avatars in order to attend educational courses in the virtual one. Students and teachers only become avatars in order to participate in lessons or in side activities. Many projects for such virtual environments have been developed for this aim by state and school institutions. However, they are at best a lab opportunity.

By contrast, immersive virtual worlds like Second Life, where avatars can create digital objects, offer popularization of science and scientific outreach ideal settings for launching and operating low cost projects that take advantage from both the digital pliability and a spontaneous strong psychological participation of the person behind the avatar (the so-called presence effect later better described).-Moreover, Second Life hosts potentially interested user communities that can be approached and retained.

This means that the makers of these projects must themselves be or become active denizens of the virtual world. Knowing the social and cultural life of the territory, is a basic requirement for the creative design of communication activity. Besides, the audience for the popularization programs is already there.