Chapter 3
The Metaverse:
3D Digital Virtual Worlds

ABSTRACT
This chapter approaches the rise of Metaverse Technologies in their 3D Digital Virtual Worlds, as a possibility that arises in the context of network learning culture, using the perspective of an emerging paradigm, linked to Teaching and Learning in Networked Society. We will present some of the main existing metaverses and discuss the capabilities and limits of this technology for learning with mobility. We will approach subtopics such as: Metaverse Technology and the nature of 3D Digital Virtual World; Second Life Metaverses; Opensource Metaverses; Metaverses in mobile devices: potentialities for Mobile Learning, as well as a brief conclusion to the chapter.

INTRODUCTION
Metaverse technology is at the core of Web3D with a wide range of possibilities for constructing 3D Digital Virtual Worlds on the internet. This technology may be considered a hybrid of virtual learning environments such as games, instant communication and virtual communities. In one way metaverse technology has launched the popularization of Virtual Reality, which presents itself in a simple and accessible way through software such as Active Worlds, Second Life and more recently, free software platforms such as OpenSimulator and OpenWonderland. This software enables the creation and co-creation, on the net, of Digital Virtual worlds which “materialize” in the collaborative construction of 3D graphic representations in several ways. These metaverses, which require human action to “become”, are viewed by specialists researching different digital technologies and their “impacts” on society as a marker for the internet when compared to the creation of the World Wide Web – WWW.

Rosedale, creator of one of the most used Metaverse Technologies, Second Life, believes that 3D Digital Virtual Worlds may evolve from their biological self-ruled form, because they can be e-inhabited by avatars – Digital Virtual representations of human beings in these worlds and a kind of “digital technological body”, through which the subject can act and interact using different textual, oral, gestural and graphic languages, while collaborating in these worlds. In this way, people construct a “digital virtual self”,

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a “digital virtual identity” when interacting with the world and other e-inhabitants – other avatars and through it they also create a “digital virtual life” or, as in the case of Second Life and as the name suggests, a “second life”.

It is precisely due to these possibilities that Metaverse Technologies have created interest in different types of organizations trying to understand this “new world” according to their specific interests. Companies like IBM, Nike, Apple, Volkswagen, Philips, Intel, Petrobras and Peugeot have been or are present in this “world” and explore their potential related to e-commerce, publicity, advertising, marketing, people management (recruiting, selection and corporate education) and v-Business. In universities and research centers, in areas such as education, communication, computer science, sociology, psychology, neurosciences and others, driven by the discussion of the man-machine relationship and the interaction between an autopoietic machine (human being) and an alopoietic machine (computer), as well as coupling arising from the interaction, Maturana & Varela, 1997 try to investigate the aspects related to this “real virtuality”, this “digital virtual life”, in order to comprehend the phenomenon.

According to the creators of the Second Life metaverse, academics are pioneers in the use and research of the metaverse. Researchers and Professors constitute the public who might better take advantage of virtual worlds, according to Cory Ondrejka, one of Linden Lab founders and creator of Second Life. “Professors first construct a virtual campus and usually try to replicate a conventional classroom with desks, chairs, walls, in Second Life…, but after a while they end up perceiving that this world allows different types of movement and communication. They perceive that in a world where one can fly, classrooms are not really that useful. Through this, professors construct new types of online classrooms without roofs, in an explosion of classroom shapes that match with what they are trying to teach” (Ondrejka, 2008). This statement made by Ondrejka (2008) reveals, using other words, what the learning theories tell us, or alternatively, that this is how the appropriation of new technology occurs. We already use known structures (old forms) when trying to understand the new reality and when trying to replicate it. However, little by little due to this interaction with what is new, in the exploration and experimenting and in collaboration, other perceptions arise and along with them, differentiation schemes, allowing the construction of new structures to assist us in broadening our existing knowledge and/or constructing new knowledge.

In this chapter we will present and discuss concepts and questions involving metaverse technology which allows the construction of 3D digital virtual worlds. We will present some of the main and current metaverses and we will discuss the capabilities and limits of this technology for learning with mobility.

METAVERSE TECHNOLOGY AND THE NATURE OF 3D DIGITAL VIRTUAL WORLDS

The Metaverse: How Does it Exist? What is Its History?

The word metaverse is a compound of the words “meta”, meaning “beyond”, and “verse” as an abbreviation for “universe”, thus constituting a Virtual Reality universe. Virtual Reality appears at the end of the 1970s when military research centers began to construct flight simulators for training pilots (Lévy, 1999). By common logic, Virtual Reality (VR) is known as a simulated environment contrary to what exists in the physical world. However, with the development of digital technologies and human fluency in using them, Virtual Reality has become more than a mere imitation of what is considered “real”. “Virtuality always proposes an experience different to the real one” (Domingues, 2003, p.4). Virtual Reality environments provide the subject with the sensa-
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