

Chapter 3

Simulation Games: Ontology

Carmelo Piu
University of Calabria, Italy

ABSTRACT

This chapter develops a reflection on the theme and the different meanings that simulation can assume in applied research ambits, and deals with the problems connected to the lack of a specific ontology shared by the scientific community. In this context, after the reflections on the interconnections between simulation and reality with a view to integrating rather than superimposing one on the other, we propose a classification for simulation in the educational field that takes the didactic, social and political literature into account and underlines the need to construct an ontology that can overcome the semantic ambiguity and support a scientific debate, with particular reference to simulation games seen from the perspective of the ecology of human development.

INTRODUCTION

The spectrum of the term simulation covers many different meanings, each of which assumes a particular significance depending on the use made of it, the context the objective and the scientific ambit in which it is used. The hypothesis is to be able

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to construct and elaborate an ontology on the theme and meanings of simulation, with reference to a classification that takes into consideration the current literature- scientific, educational, cultural and political. Our aim, therefore, is overcome the semantic ambiguity that has dogged the concept of simulation, and provide an overall synthesis in terms of classification, description and interpretation, that can lead towards a unified and accepted theory. To do this it is necessary establish close and symbiotic relationships between the two domains of simulation, i.e., simulation, object of analysis, and the *ontology*, the meanings that generally attributed to it, in order to provide clarification. In other words to build on the semantic plane a shared hypothesis which combines the two terms.

ONTOLOGY AND SIMULATION

Despite its original setting that was eminently theoretical in nature, ontology is assuming an ever-increasing practical relevance. Recently it has been used in the field of Artificial Intelligence and of *representation of knowledge* and thus for a variety of ends amongst which inductive reasoning, classification (concept repertoires) and various techniques for problem resolution (Wikipedia, 2008), as well as facilitating communication and information exchange. There is a need to create general and defined schemes to develop data sets to provide a coherent description within the domain under inspection, in this case simulation. In this sense, ontology is essentially taken to indicate an attempt at formulating a clear conceptual scheme. Such conceptual schemes are “to have value”, Paparella (2007) notes, “not just as *principles*, but as rigorous points of reference, justified, appropriately motivated, carefully documented, and thus usable as control criteria” of the very discourse of simulation. In general, it is a question of creating a *data structure*, which contains the relevant entities, the relations existing between them, the rules, the axioms and the specific constraints, from which grades of freedom of ideation, creation and planning of simulation games may be derived. It is important to create a structure formalized through semantic language, linked on the basis of a formal logic. This is a *foundational and formal ontology* to be used as a glossary or as a database, i.e. a conceptual scheme for classification, which also includes the semantic relations in order to describe the ways in which the concepts are interrelated (Bottani, Davies 2006; De Monticelli, Conni, 2008). Varzi (2005) maintains that the objective for ontology is to *classify* what already exists, and that as you cannot classify something without knowing what it is, the task of ontology is to “draw up a sort of complete and detailed inventory (at least in principle)” (Varzi, 2003) of all that is known of a certain scientific domain.

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