

Chapter 9

A Bioeducational Approach to Virtual Learning Environments

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ABSTRACT

Knowledge carries some general characteristics related to the socio-environmental, cultural, and bio-physiological contexts. These three coordinates help us to understand under which condition knowledge is achieved/gained and they do it. Along the same line, the real or virtual learning contexts being essential and unique, the possibilities offered by the VLE which give the opportunity of programming environmental challenges, complexity, and support for subjects open up a series of educational perspectives that support individual differences even when they reproduce social platforms as virtual worlds. Programming that through adequate representations of environments, situations, problems, and specific actions are able to work on more complex neuronal patterns usually activated in the presence of real objects, especially in light of the current structures present in formal contexts of education.

INTRODUCTION

This work aims to examine the possible convergences between the theoretical expressions of the bio-educational sciences, their origin, and historical-scientific evolution, their current developments in educational research, as well as their formative implications applied to VLEs. This need is addressed here by reconstructing historically and theoretically, the biological and cultural bases of the evolving subject according to the typical approach of the bioeducational sciences. This scientific approach tends to combine the subject's transformative expression through the analysis of gene/environment, nature/culture, and individual/environment interactions. The intent is to research how the individual's formative growth is linked to the epigenetic expressions determined by the subject/environment interactions understood as real and/or virtual.

Subsequently, we did a theoretical reconnaissance on VLEs to search for possible epistemological convergences with the epigenetic hypotheses of the bioeducational sciences. Everything was analyzed

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in-depth theoretically in order to have a broader vision for developing digital learning environments able to involve the subject in training, along with stimulating, and transforming the subjects.

The bioeducative sciences. At the end of the 1970s, Biopedagogy is viewed as a phenomenological analysis and an interpretative key to the educational reality.

Around the 1970s, with Debesse and Mialaret (1973), biology's contribution to the pedagogical discourse began to be outlined as substantial. In this context, the birth of *biopedagogie* was defined as a mediating relationship between biology and pedagogy.

This useful interlocution between the two disciplines, considered complementary later, is not fully defined as biopedagogy. In this epistemological framework during the 80s, Elisa Frauenfelder tries to overcome the relationship between biology and pedagogy, very evident in biopedagogy, to combine the biological with the cultural (Santoianni, 2006).

This has been possible due to all the work of E. Frauenfelder (1983), who attempts to combine the lessons of J. Monod (1970) and J.C. Eccles (Eccles, 1953; Eccles et al., 1954) and to apply them to the dynamics of learning. The scholar of such a crucial element's recognition and support was the importance indicated to the biological component in the learning dynamics linked above all to brain functioning and its plastic capacity.

However, during the scientific development of his ideas, these studies were often accused of scientific "reductionism," as it seemed to attribute more weight to the *bios* element than to the cultural aspect of the *logos*. The eternal debate between biological development and cultural development seemed to have made the philosophical component succeed in evolving fragile, pedagogical epistemology over the preceding decades. This last seemed to be predominant in the formative discourse but against a scientific vision of evolutionary processes. This vision was later put aside to the significant tensions produced by a positivist scientific pedagogy.

The tensions towards positivism were born from the ideological basis's disagreement (Tisato, 1967; Di Pol, 2007; Cavallera, 2010). For some people, it was a scientific-ideological result of the bourgeoisie at the end of the 19th century. Therefore, it was centered on the values of productivity and industrial progress, not in line with the transformative, moral, and ethical vision of education. The weakening scientificity process as a reference system in the human sciences originated due to the philosophical-pedagogical proposals of American pragmatism and all European activism. The latter saw in M. Montessori, the most inventive of pedagogical thought formed by the practice of profound reflexivity still applied to a scientific method borrowed from the medical world and applied to the world of education.

So, the weight of the pedagogical paradox lay in a double philosophical and scientific nature. Some considered it opposed, while for others, it was superseded but never actually resolved in the dispute's epistemological substance. Indeed, a large part of the reflexivity of philosophical pedagogy, or philosophy of education, has always depended on elements declined in practice that recalled a dynamic process internal to the educational processes. Without this last, pedagogy itself seemed to weigh on actions that were neither codified nor modifiable and so unrepeatable. During this process, educational action became the victim of reflective prejudice, imputing non-reflectiveness, and improvisation parameters. However, in Italy, because of totalitarian reasons until 1943 (the arrival of the Americans in Sicily immediately gave rise to a reform of the scholastics programs freeing them from the fascist ideological matrix), a vision of the educational phenomenon as an idealistic spiritual principle prevailed. Here, the educational one guaranteed a constructive relationship, which translated into an "educational act" between the teacher and the learner. In essence, the teacher was believed to represent knowledge and right, and with these considerations and beliefs. He also represented the correctness of the educational act, according

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