Chapter 12
Complex Learning:
A Way of Rethinking Teaching and Learning

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ABSTRACT

This chapter presents Complex Learning, a pedagogical approach based on personalization, hybridization of learning environments, tools and codes, and participatory learning. In this approach, students are supported to become active users and co-producers of learning sources, within the paradigms of complexity, transactional theory, and ubiquitous learning. Its innovative connotation rises up from the pedagogic literature that defines it as a new pedagogical model and from the experiences realized by the authors during the recent years. Complex Learning is able to face the challenge of rethinking teaching and learning, empowering and renewing adult learners' and trainers' competences, attitudes, expectations, and effort. Here are described the theoretical foundations, the methodological issues, the practices, and the future perspectives of application of the Complex Learning approach. The practices carried out demonstrate that Complex Learning, with its characteristics of openness, dynamism, and flexibility, can be successfully applied to the fields of vocational training and adult education; they also indicate that, in order to have tangible results, it is necessary to work towards a change in the educational perspective and toward the acquisition and consolidation of specific competences of trainers and tutors.

INTRODUCTION

In this chapter is described a pedagogical approach named Complex Learning, based on personalization, hybridization of learning environments, tools and codes, and participatory learning that support students in becoming active users and co-producers of learning sources. It can be defined an emerging educational approach attempting to meet the challenge of the growing complexity of knowledge in an increasingly globalized world, in which reality takes on the connotation of unpredictability and liquidity.

Complex Learning reflects the complexity of reality interpreting it as an opportunity of meaningful learning, educating learners through the enhancement of metacognitive skills and self-directed learning competences. The learner is not a consumer, but a creative, reflective and aware co-designer, capable of moving with expertise in the *continuum* of the knowledge society. In Complex Learning, which is grounded on the paradigms of complexity, transactional theory and ubiquitous learning, technologies play a crucial role, supporting the construction of personalized learning environments and allowing learners to interact at a distance, making also possible the sharing of biographies and informal learning experiences possessed by each participant. However, the approach is not simply a blended learning solution. Often we tend to consider technology a solution to teaching and learning problems, but we continue to apply methods and strategies typical of the face-to-face education, with the result that we replicate dynamics based on the transmission of knowledge and the one-to-many communication. The Complex Learning approach proposes instead a new and different way of conceiving learning, teaching and the processes of building, sharing and disseminating knowledge.

In this work we illustrate Complex Learning from the theoretical, methodological and practical point of view, describing its conditions of implementation and the results obtained from the studies and experiences conducted for several years; then, we suggest future prospects of application and research.

THEORETICAL FRAMEWORK

The Challenge of Complexity

The real world is complex, as well as our experience of life, our way of perceiving, thinking and knowing reality, and with the complexity we face daily (Haggis, 2009; English, 2011). Complexity makes us uncomfortable if we try to interpret it according to the linear and sequential patterns with which we are accustomed to think, learn and act. The term itself does not have a single meaning, and can be interpreted in different ways - sometimes conflicting, sometimes complementary - depending on the domain of knowledge in which it is contextualized.

In 1948 the American scientist Weaver called "organized complexity" all problems involving simultaneously a large number of factors that are interconnected in an organic totality (Weaver, 1948). The Chaos theory, developed in the later time, says that the behavior of a system depends on its initial conditions, and we cannot predict or distinguish from a random process, even if it is deterministic in a mathematical sense (Kellert, 2008).

Complexity theories cover different areas of knowledge (Davis & Sumara, 2006). Their emergence is commonly traced back to the establishment of the Santa Fe Institute in 1984 to investigate the nature of complexity from a multidisciplinary point of view (Mitchell, 2009). However, we can identify previous examples in the Bertalanffy's general systems theory (Weckowicz, 1998), in the Whitehead's philosophy

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