

## Chapter 2

# Innovation and Creativity in Applied Learning Theory and Design: A Frontier Research in Pedagogy

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### ABSTRACT

*Innovation and creativity are two modern concerns in educational sciences. These terms cannot be understood without the investigation of technology of contemporary learning environments. The learning design of these environments aims to describe (meta)cognitive activities and sequences of teaching, assessment and learning processes. Recent years have seen a ground in the number of peer-reviewed articles that investigate innovation and creativity in digital textbook learning environments. This chapter analyses EBSCO HOST and Google Scholar databases in order to prove MetaSystems Learning Design approach. This presents unique insight into significance of frontier research in pedagogy. These chapter reviews peer review articles and interprets their findings in order to answer the following questions: (1) What is the theoretical basis for understanding innovation and creativity in applied learning theory of digital textbooks? and (2) How do pre-existing innovation and creativity tendencies influence the way of frontier research in pedagogy?*

### INTRODUCTION

Globalization opens a new context for learning: knowledge-based economies and societies moves faster than information societies; students learn in multiple ways that differ from traditional methods; cross-disciplinarity, trans-disciplinarity and new forms of decision-making are encompassed within

self-regulated learning through Massive Open Online Courses (MOOC) and/or in universities that serve as “business incubators” (Schmitt, 2014) for future entrepreneurs and leaders in science. From one point of view, the educational system has been changing from closed to more open and flexible (Frick, 1991). From a second point of view, the mobility scoreboard indicates new conditions for

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learning: foreign language skills, credit portability, credit and degree mobility and common recognition of learning outcomes. The strategic points of view refers to “assuring quality in education” (Delhaxhe, et al., 2015); “turning tides in school evaluation” (Puhl & Crosier, 2015) and “wedding access to learning opportunities” (Eurydice, 2015). Nevertheless, “happiness is a condition for successful education and the potential outcome of it” (Crosier & Puhl, 2014). Researchers have identified three main indicators that determine a better life:

- Educational attainment,
- Years in education,
- Performance in reading, math and science.

Today education is more important than ever. Education can improve health, civic participation, happiness, a sustainable living environment, and more. Two important priorities in education are innovation and creativity. *Innovation in education* refers to a better idea, method, or new solution, something original and more effective “that meet new requirements, in articulated needs, or existing market needs” (Maranville, 1992), particularly for “designing 21<sup>st</sup> century learning environments” (Kools, 2013), through openness and (meta)cognitive strategies. In traditional pedagogy innovation is a term indicative of some improvements in didactical processes (educational policies, curriculum, practice, assessment etc.) that may lead to better educational outcomes. “The innovation is more likely when people of different disciplines, backgrounds, and areas of expertise share their thinking” (Amabile & Khaire, 2008). Innovation in education means making the learning process better or more effectively planning activities for guaranteed educational outcomes. *Creativity in education* is the most important factor of innovation. Among the multitude of definitions, models and approaches to creativity, Mumford (2003) identifies creativity as involving “the production of novel, useful products” (p. 110), with improved

self-esteem, motivation and achievement. In this context students gain new skills: critical thinking, interpersonal and self-directed learning, etc. However, the concept of creativity is described different in different cultures, strategies, patterns, profiles, mechanisms, and/or processes. According to Amabile (1998, pp. 78-80), creativity is a function of expertise, thinking skills and motivation. These skills depend on thinking models and on the type of environments in which the thinking models were developed.

Research in learning design has been taking place since late 1940. The field was set when it became important to rapidly train a large numbers of people to perform complex tasks. First theoretical approaches were: Bloom’s Taxonomy of Cognitive Domain (1956); General System Theory (1950), Gagne Psychological Principles in System Development (1962), Glaser Instructional Systems (1962), Banathy’s Model (1968), and Cognitive Load Theory (1986-present). The most recent approaches are associated with MOOCs, metadata, learning analytics, metacognition, meta-knowledge, and more.

There are three main approaches to learning design: linear design, systematic design and metasystems learning design. Thus,

1. Linear design refers to a model of design in which a didactic problem or issue is well-identified and teaching/assessment phases are defined chiefly in terms of lines 1, lines 2...lines N. The instructional designer determines the flow of information from the start to the end, and the teacher(s)/student(s) use the content without any interventions. They must follow the predetermined learning path to gain the whole instructional message. The linear model may involve some non-linear elements, such as hyperlinks or pop-ups, but, nevertheless, learners have to follow the same learning path from the start until the end.

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