



# The evaluation of creativity from the perspective of subject matter and training in higher education: Issues, constraints and limitations



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## ABSTRACT

Creativity in organizations is presented as a phase of innovation and is a crucial issue at the core of the economic system. In the area of economics and management, it is acknowledged that auditing the creative process ensures the longevity and competitiveness of companies. Research indicates how creativity could be evaluated and controlled, but debate is intensive and many critiques have been formulated. In this article, we invite readers to consider an interdisciplinary approach emphasizing the importance of contextualizing research on the evaluation of creativity and the perspectives of training in higher education. From a discipline-oriented posture, evaluating creativity in research requires taking into account methodology frameworks and prudence with regard to social and cultural contexts. Creativity is addressed critically, primarily questioning its very definition and the aims of the evaluation. With regard to work on the subject, we explore the evaluation dimension of creativity and identify three potential invariants that could enter into interdisciplinary dialogue on the creative process. In the discussion, we address crucial points stemming from the learning process of creativity among engineering students in higher education where the challenge is to develop one's creative potential.

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## 1. Introduction: the disciplinary integration of creativity and its limits

Creativity and the evaluation of creativity have been widely studied and subjected to critiques by researchers. Its use in research work is due to the economic, scientific and training value it brings to individuals. Although it bears the same title, research work does not address the same aspects of creativity and its evaluation because the objects, purposes and resources are different. The fundamental requirement of all research objects is that their subject be defined. The difficulty to address in this case is the need to pin down a discipline. All creativity research involves multiple epistemological, theoretical and methodological ties that sometimes make comparison impossible. This brings up a series of questions dealing with the issues and purposes of evaluations, such as what should be measured, how and why? The objective of this article is to

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highlight these issues, their constraints and the limits of creativity evaluations with regard to various disciplines and their contributions to arriving at a definition for creativity. Here we will briefly retrace research objects and the end purposes of evaluating creativity in our specialty disciplines of economics, engineering and educational sciences under the broader scope of human and social sciences. These items present heuristic potential and have limits that we have been able to identify.

This research is the state of art of a post-doctoral research conducted within the DEFI project (Definition of Inventive Efficiency, Alsace Region, France) in a design laboratory of an engineering school in France. The project's aim is to characterize the notion of inventive efficiency in design and develop ways to measure this in order to achieve indicators that will assist companies in locating the collective creative capacities of those involved in their R&D. This project is the framework for a doctoral thesis in engineering sciences and post-doctoral research in education sciences. In this project, an analysis of our various disciplinary perspectives led us to wonder about the conditions for an interdisciplinary dialogue on creativity and ways for measuring it. Our questions were focused on specific disciplinary issues and the purposes of creativity assessment in organizations. The work also made us aware of the limits of interdisciplinary dialogue. Starting with a comprehensive approach, we sought a common thread among our disciplines regarding the creative process in organizations. The issue of measuring creativity was then to determine its objects and purposes. From previous work (Fischer, 2011), we identified certain invariants from the perspective of training for creativity and some of their implications for training in higher education. This led us to place the focus of our research on assessing creativity from primarily an organizational, cognitive and educational perspective.

From the perspective of the research process, we submitted search queries on multiple search engines, including Science Direct, Eric, Google scholar and Cairn. We interviewed thematic research equations combining the keyword "creativity" with other keywords such as "inventiveness"; "innovation" "assessment"; "measure". The results indicated a decided scarcity of articles on the concept of inventiveness; as pointed out by a PhD thesis in the DEFI project that we did not use. With regard to assessing creativity; the studies were more oriented toward engineering; searches of the term "innovation" produced too wide a field of study. We focused our research on recent studies of articles published between 2000 and 2014 that featured summaries of work; empirical studies and trials; as well as interdisciplinary questions focusing on training; organizations and the limits of assessing creativity. This research is meant to be exploratory and does not claim to be an extensive review of the issues; something that certainly warrants further examination and development.

The article is not intended to define inventive efficiency in design. Its initial purpose is to spur consideration of interdisciplinary invariants and their limits, with a view to better understanding the process at a meta level. Subsequently, the goal is to see how those invariants could be incorporated into training. We aim to participate in building a scientific model of creativity for research and training in higher education by posing some preliminary questions on interdisciplinary dialogue. We start by calling into question the very disciplines that we represent, namely management, economics, engineering and human and social sciences, with the notion of testing the extent of their limits.

### 1.1. *Management and economics: the effectiveness of organizational and local systems*

Schematically, management and economics sciences orient their work on organizational structure, its nature, its typology and a context, such as markets or finance. The management approach to creativity questions the organizational context that leads to a high or low creativity project (Amabile, 1996b). The following components of work environment assessment are related to high creativity projects: work group supports, challenging work, organizational encouragement, supervisory encouragement, organizational impediments and freedom of action. Assessment of creativity levels is done by independent experts. While this research sheds light on the work environment, the criteria used to assess creativity by experts are not broken down in a precise manner. The approach recommended by creativity management is based on a belief in the rationality of processes and controlling them. A fundamental difficulty consists in identifying the process itself, and consequently in controlling creativity.

"The decision to measure creativity has led companies to implement standardized and rationalized management practices for creativity. *Yet measuring and standardization, which may be effective in numerous instances, are nonetheless ill suited to creativity management. Reducing creativity to the simple application of standardized processes would effectively lead to altering the concept and ultimately inhibiting it.*" (Auger, 2004, p. 3).

The non-random aspect of developing creativity is one that is difficult to conceive of for a company that seeks to control creativity and its systematic nature. When presented with the same problematic, individuals come up with different answers. Conventionally, traditional management styles are based on objective models that shape the creative process. The author points out that these processes are part of complex situations that need to be described. To accomplish this, she recommends an inductive management model based on identifying creative dynamics in an organization to be transformed into innovation (Auger, 2008).

### 1.2. *Engineering: effectiveness of producing ideas and products*

The field of engineering broadly addresses the production of ideas, products and processes. The effectiveness of idea generation can be linked to the methods used by engineers to generate concepts (Shah, Vargas-Hernandez, & Smith, 2003).

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