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Behavioral indicators of innovators. A search protocol for a systematic literature review

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Abstract

Introducing greater innovation into the culture and capabilities of organizations worldwide, a requirement of today's society, is an issue currently in need of scholarly attention. The present investigation is being undertaken within the context of FINCODA, a European Project involved in the development of new reliable tools for innovation competences assessment. The study aims at devising a search protocol for a systematic review of the literature on behavioral indicators of innovators published from 2000 onwards, indexed in Scopus, Web of Science and Google Scholar. The specific keywords used in the search include the following fields: (1) workplace; (2) innovative behaviour, innovative work behaviour and individual innovation; (3) indicators. A preliminary search with these keywords retrieved 1,350 references. Then, the process of filtering data by title and abstract to meet inclusive and exclusive criteria refined the search. The materials identified are expected to prove useful in the definition of behavioural indicators of innovative people at work. Moreover, they will help in the analysis of the relation of the descriptors found with the innovative indicators of a barometer created within a previous European Project, INCODE, and in the further design of a tool to measure employees' innovation.

Keywords: Workplace, innovative behaviour,indicators.

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1. Introduction

Present trends in companies and organizations have revealed the potential of innovation to meet the challenges of the 21st century. As a result of the new requirements, companies and organizations have to adapt to the working dynamics of a more globalized world in a continuous change. Universities have recently shown great concern in assessing not only the core or basic competences of the students, based on knowledge, but also their personal competences, i.e., skills and attitudes that, together with knowledge, will further meet the features of future professionals demanded by organizations.

The European project INCODE, in which the authors of this paper were involved, was concerned with ensuring the success of the transfer from innovative ideas into innovative products and services depending on the successful integration of pedagogical knowledge into working-life innovation activities. INCODE developed a barometer to be used as a tool to evaluate innovation at university level. Our present field of research within the framework of a new European Project, FINCODA, aims at identifying and classifying behavioral indicators of innovators. The challenge now is to identify the indicators which may become the key for innovation in people working for organizations in order to enhance them. To this end, FINCODA will, firstly, analyze the traits and qualities that make a person innovative, being different from the rest of his/her co-workers. The definition of the dimensions and the contexts in which innovation is measured is a fundamental stage in the assessment of competences (Marin-Garcia, Perez-Penalver & Watts, 2013; Lohmann, & Prumper, 2006).

Secondly, FINCODA will develop the necessary tool to measure employees' innovation behavior. Such tool focused on a competences-based approach will have important implications in the process of staff recruitment of organizations (Boyatzis, 2008; Moore, Cheng, & Dainty, 2002; Rowe, 1995). It will carry out a formal evaluation of the employees' work by means of specific indicators, the objectivity of which will depend on the dimensions of the competence to be assessed (Marin-Garcia, Bayarri, & Huerta, 2015). Making the right decisions related to the assessment of innovative behavior and its impact within organizations will guarantee the reliability and validity of the workers' competences and foresee their future performance.

In this concern, the present paper addresses the search protocol devised to make a systematic literature review of behavioral indicators of innovators.

2. Contextual framework of the study

2.1 Innovation and competence

Innovation is a multistage process, with different activities and different individual behaviors necessary at each stage. When referring to innovation, we are referring to change (Tidd, 2000), and this change necessarily increases value, i.e., customer, producer, economical or social value. OECD/Eurostat (2005) defines innovation as the implementation of a new or significantly improved product, good, service or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations.

As for competence, Villa, & Poblete (2007) defined it as good performance in diverse, authentic contexts based on the integration and activation of knowledge, standards, techniques, procedures, abilities and skills, attitudes and values. Recommendations by the European Qualifications Framework for Lifelong Learning (European Parliament Council. 2008, 4) define competence as "the proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development", and relate the terms responsibility and autonomy to its meaning. Competence can also be defined as a complex know-how resulting from the integration and adaptation of capacities and skills to situations having common characteristics (Fernández March, 2010; Lasnier, 2000). For Tardif (2006) this complex know-how is supported by the effective mobilization and combination of a variety of internal and external resources within a family

of situations.

Competences together with capacities and skills are three levels of complexity in a contextualized know-how. A competence is formed by a set of capacities and these, in turn, are formed by a number of skills which are required for a more and more complex professional performance. Capacity is a medium complex know-how that integrates skills which need procedural and conditional knowledge. Skills are a simple know-how (Bessant, Caffyn & Gallagher, 2001; Fernández March, 2010; Lasnier, 2000).

2.2 Behavioral assessment and behavioral indicators

Behavioral assessment is concerned "with clearly observable aspects in the way a person interacts with his or her environment" (Groth-Marnat, 2003: 103). This 'observable' feature is a behavioral indicator that shows the presence of the particular competence (Dent, & Krefft, 2004) or evidences the degree of development of this competence (Cruz Serna et al., 2012). Therefore, the descriptors sought have to be specified as 'observable' and 'measurable' behaviors to allow for a better assessment of staff performance and of their management and development (Muchinsky, 2006). The more behavioral indicators that surface during, e.g., an interview, the greater the likelihood that the candidate is strong in a particular competence (Dent, & Krefft, 2004).

Behavioral assessment focuses on issues as, e.g., why target behaviors occur, how behaviors should be measured, the preferred level of analysis, the possibility of change, and complexity. These assumptions are obvious in the use of specific assessment procedures that are designed to yield data from well-defined and validated measures of target behaviors and contextual variables for an individual client (O'Brien et al., 2010). Furthermore, a behavioral assessment also fosters the design of the measuring instruments that can be validated and standardized, thus, reducing the subjectivity of the process of staff assessment (Arias, & Heredia, 2006).

2.3 Scholarly research related to innovators' characteristics

Individual innovation begins with problem recognition and the generation of ideas or solutions; then it attempts to build supporters for it and finally, the idea is materialized (de Jong, & den Hartog, 2010; De Spiegelaere et al., 2012; Scott, & Bruce, 1994). Therefore, many intrinsic characteristics of the individual come into play as, for example, problem solving style, curiosity, motivation, creativity, efficacy, optimism, persistence, initiative, etc. (Scott, & Bruce, 1994; Patterson, 2000; Cerinsek, & Dolinsek, 2009; de Jong, & den Hartog, 2010; Waychal, Mohanty & Verma, 2011; Marin-Garcia et al., 2013). But also the relations established with other people are important during the development of the idea. Hence, communicative competences, group work, conflict-solving or leadership are a part of the process (Berdrow, & Evers, 2010; de Jong, & den Hartog, 2010; Kleysen, & Street, 2001; Marin-Garcia et al., 2013; Patterson, 2000; Scott, & Bruce, 1994; Waychal et al., 2011).Scholarly research has provided different barometers on the dimensions of innovation competences of a worker and how to measure them (Cerinsek, & Dolinsek, 2009; de Jong, & den Hartog, 2010; Kleysen, & Street, 2001; Marin-Garcia et al., 2013; Patterson, 2000; Waychal et al., 2011;). For instance, as the model of INCODE project (Kairisto-Mertanen, Penttilä & Nuotio, 2011; Marin-Garcia et al., 2013) suggests, the capacities and skills that make up innovation competence can be classified in three dimensions: individual, interpersonal and networking (Figure 1):

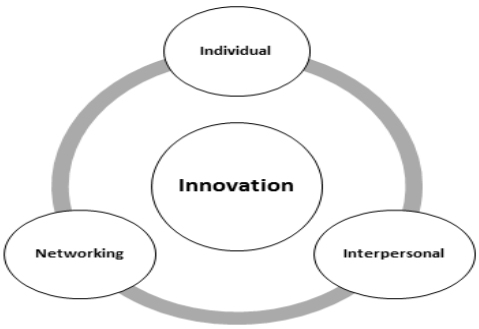

Figure 1. Dimensions of innovation competence (Marin-Garcia et al., 2013)

As for systematic literature reviews already published, some seminal works have dealt with innovation. For example, Patterson et al., (2009) provide a large body of research and empirical evidence on individual innovators and how creativity and innovation operate in organizations. The authors depart from studies on extant methods, tools, and techniques used to foster innovation. The study analyses in detail employee resources for innovation, work environment, innovation processes in organizations and implications for policy and interventions. Hammond et al., (2011) authored a meta-analysis quantitative study that addresses the different phases of the individual innovation process at the workplace from the perspective of individual differences, motivation, job characteristics, and contextual influences. A recent publication by Anderson et al., (2014) consolidates scholarly research on innovation by focusing on literature published from 2002 to 2013. They synthesize several theories of creativity and innovation into a comprehensive levels-of-analysis framework, and highlight studies on individual, team, organizational, and multilevel innovation that have significantly influenced thinking and understanding in this field.

2.4 Justification for the need of the present systematic literature review

The impact of innovation within organizations has been of general concern (OECD/Eurostat, 2005) but it is necessary to examine and consider the elements that drive this current effect. These elements are focused on people, not only on production processes, distribution of goods, new markets or any other issue. Although previous literature reviews and research are exhaustive in the description of the key elements that have an influence on the innovative behavior of employees at individual, group or organizational level, there is a research gap in the field. Specifically, the employee's behavior, the real innovator, which has become the core of this study, is in need of further research. The main objective of a systematic literature review is to identify the behavioral indicators of innovative workers and classify them into categories.

3. Research Questions

The research questions posed for a literature review of scientific research on behavioral indicators of innovators are the following:

- What is a behavioral indicator?
- Which are the behavioral indicators that identify innovative people?
- Which is the most suitable classification of behavioral indicators for the assessment of innovation?

4. Methodology

Specific keywords were devised to be used as a search protocol strategy to identify and analyze the indicators related to innovative behavior found in the literature:

(a) Workplace: employment, work, company, organization;

(b) Innovative behavior, innovative work behavior and individual innovation;

(c) Indicators: markers, patterns, descriptors, components, characteristics, factors, observations, parameters, determinants.

These keywords were used together with the following inclusive criteria:

- papers in English language;
- papers indexed in Scopus, Web of Science and Google Scholar;
- papers published from 2000 onwards;
- Theoretical studies, literature reviews, experimental or quasi-experimental studies, meta-analyses.

These exclusive criteria were also incorporated to the search:

- company/organizational innovation;
- Innovation assessment in education.

The following databases were accessed in the search:

- Elsevier's Scopus, the largest abstract and citation database of peer-reviewed literature;
- Thomson Reuter's Web of Science, a comprehensive and versatile research platform that accesses the most reliable, integrated, multidisciplinary research;
- Google Scholar, a freely accessible web search engine that indexes the full text or metadata of scholarly literature across an array of publishing formats and disciplines.

Lastly, the search was completed by including Internet searches that might retrieve unpublished studies and other suitable materials still in print. The following search strategy and limits in Table 1 were used in the three different databases to obtain the references required and later saved. The total number of references retrieved was 2,264.

Table 1. Search string with Scopus, Web of Science and Google Scholar

Scopus	References retrieved
(TITLE-ABS-KEY (innovat* W/5 behavi*) AND TITLE-ABS-KEY (work* OR employ*)) AND PUBYEAR > 1999 AND (LIMIT- TO (SUBJAREA , "BUSI") OR LIMIT- TO (SUBJAREA , "SOCI") OR LIMIT- TO (SUBJAREA , PSYC" OR LIMIT- TO (SUBJAREA , "ECON") OR LIMIT- TO (SUBJAREA , "DECI") OR LIMIT- TO (SUBJAREA , "MULT"))	754
Web of Science	Retrieved
(TS=((innovat* near behavi*) AND (work* OR employ*))) AND Idioma:(English) Refinado por:Áreas de investigación: (BUSINESS ECONOMICS OR PSYCHOLOGY OR BEHAVIORAL SCIENCES OR SOCIOLOGY OR SOCIAL SCIENCES OTHER TOPICS) Período de tiempo: 2000-2015.Índices:SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH.	773

Google Scholar	Retrieved
https://scholar.google.es/scholar?as_q=&as_epq=innovative+work+behaviour&as_oq=observat+measure+assessment+indicator+model+pattern+descriptor+characteristics+marker+component&as_eq=&as_occt=any&as_sauthors=&as_publication=&as_ylo=2000&as_yhi=2015&btnG=&hl=es&as_sdt=0%2C5 observat OR measure OR assessment OR indicator OR model OR pattern OR descriptor OR characteristics OR marker OR component "innovative work behavior"	737 (Only the first 200 were selected by relevance)

It is important to highlight that there was a reduction in the number of references obtained with Google Scholar by applying the criteria of relevance and date of publishing; finally, only 200 of them were saved. Moreover, a critical appraisal analysis discarded false positive ones, i.e., studies not closely related. False negative ones were also incorporated, and overlapped references were deleted. Hence, the final collection from the search was reduced to about 1,400 references. Mendeley, a free software tool reference manager and academic social network platform, was used to organize the references found. The results obtained from the three databases were then merged into one and ordered alphabetically.

5. Next steps for ongoing research

The three researchers together will perform the first screening of 100 references in total in a joint session. This group work activity will serve the purpose of verifying that there are no discrepancies among the researchers and that the criteria for the selection are clear enough. Secondly, an equal number of references will be analyzed by each of the researchers individually and the most relevant ones will be selected. In order to provide a more reliable analysis, there will be an overlap of 10% of the references assigned to each of the researchers respectively so as to agree on the selection process and, thus, avoid discrepancies. So as to fulfill the purpose of further research, a number of references selected by the three researchers are expected to devise the dimensions, descriptors and behavioral indicators related to innovation. It is important to point out that during the screening process, other new references may be added to the list when found through the so-called snowball effect.

After the above mentioned process, the articles identified in the search will lead the researchers into the next step of the review: title and abstract will be screened to determine if the references provide relevant details for the research purposes. Three researchers will use Loesel and Schmucker´s scale (2009) in the labeling process of the articles: (1) clearly fitting the inclusion criteria; (2) ambiguous; (3) clearly not-fitting the inclusion. Information from relevant references collected will be coded with the software *Atlas.ti* focusing on:

- Type of organization;
- Type of behavior assessed;
- Relation of the behavior assessed with innovation;
- Assessment tools (questionnaires, interviews, etc.).

Once the references have been coded, a report will be written about the results of the review.

On balance, the steps set out in the previous paragraphs will eventually lead to a literature review on the subject that will provide a highlight in the identification and classification of the indicators and categories which are the key for innovation in companies. FINCODA's further design of a tool to measure employees' innovation is hoped to yield some light on innovative workplace performance useful to the human resource sections of organizations.

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