



Organizational learning: Proposal of an integrative scale and research instrument



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ABSTRACT

This study describes the development and validation of an instrument to measure organizational learning. Starting out from a comprehensive analysis of the main organizational learning models in the specialized literature, the organizational learning scale in this study consists of 18 items forming five dimensions: the ontological levels of learning, modes of knowledge conversion, learning sub-processes, types of learning, and feedback and feed-forward flows of learning. A survey to large Spanish companies provides data from 167 companies. Confirmatory factor analysis tests the construct measurement model and validates the scale. The results of the study indicate that the scale satisfies the criteria for reliability, and validity. The exploratory factor analysis permits the identification of four factors which make theoretical sense: information systems, the existence of a framework for consensus, procedures for the institutionalization and broadening of knowledge, and forms of management and the genesis of knowledge. The new construct promises to be more comprehensive, integrative and eclectic than previous constructs, achieving its broad scope by incorporating a number of the main theoretical perspectives on the matter. For practitioners, the scale could form the basis of an auditing tool, as well as being a useful target for organizational change initiatives.

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1. Introduction

Probing into the study of learning from the perspective of corporate policy and organizational theory often results in a feeling of only reaching a superficial level of understanding. Perhaps for this reason, and not only for its merely instrumental use by company management, the study of these concepts attracts an incessant and ever-growing interest. Despite academic interest in the subject, an integrative and comprehensive theory of such a complex, dynamic concept is still a long way from crystallizing. Nonetheless, scholars define the concept as, 'the study of the learning processes of and within organizations' (Easterby-Smith & Lyles, 2003: 9).

Together with other priorities for current and future research on the matter, a key issue is the development of a valid, reliable measurement instrument for organizational learning (Easterby-Smith & Lyles, 2003). Each empirical study and measurement that aims to capture the organizational learning phenomenon usually restricts itself to a single theoretical model. Consequently, discrepancies arise in the scales as frequently as in the theories themselves. The main contribution of this paper to previous research consists of the theoretical comprehensiveness of the design of the measurement tool, and the complexity of the phenomenon that this measurement is able to capture.

First, the current study, reflecting the multidimensionality of organizational learning, adds value to the existing scale. To do so, the study considers the ontological levels of learning, modes of knowledge conversion, learning sub-processes, types of learning, and feedback and feed-forward flows of learning. The ontological levels of learning are: individual, group, organization and inter-organization (Nonaka, 1994). The modes of knowledge conversion are: socialization, externalization, combination and internalization (Nonaka, 1994). The learning sub-processes are: intuiting, interpreting, integrating and institutionalizing (Crossan, Lane, & White, 1999). The types of learning are: exploitation and exploration (March, 1991). The study also takes into account the feedback and feed-forward flows of learning (Bontis, Crossan, & Hulland, 2002; Crossan et al., 1999). The result is an eclectic and comprehensive measurement. Second, this study not only aims to validate the scale but also to identify, through exploratory factor analysis, the dimensions that make up the construct. A discussion of this construct then addresses its theoretical meaning. Third, the research aims to show in detail all the phases of the complete process of validating the scale, whereas some studies only reveal the research results but not the process. This approach is useful for scholars who wish to develop further measurements in this field or other related fields.

In summary, this paper aims to deliver three contributions to the literature on organizational learning: first, by designing and validating a comprehensive scale to reflect the theoretical and practical complexity of the concept; second, by discussing some factors that make theoretical sense arising from factorial analysis; and third, by showing the whole process of validation to help future research on developing scales. For

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practitioners, this study may also give rise to the development of an audit tool to enable managers to unveil weak organizational learning dimensions.

The next section contains an extension of the discussion on the theoretical perspectives of organizational learning, and sets up the theoretical framework for the construction of the scale. The methods section provides details about the sample, data collection, and the development and validation of the measurement instrument. Finally, the last section brings together the empirical findings and closes with a discussion of the results, implications, and conclusions of the study.

2. Theoretical background

2.1. Dimensions of organizational learning

An important distinction in the literature is whether the focus is on the organizational learning itself, or on the organizational context or conditions that facilitate the processes of learning. This second perspective covers studies about learning capability (Dibella, Nevis, & Gould, 1996), the learning organization (Senge, 1990) and analysis of learning enablers (Nonaka & Takeuchi, 1995).

The current study centers on the first of these two perspectives to design and validate a scale for measuring the process of organizational learning itself. However, although the focus is on this first perspective, the influential works of Crossan et al. (1999) and Nonaka (1994) provide good examples of the distinction between the theoretical models in organizational learning and knowledge creation.

In this study, the term organizational learning embraces the concept of knowledge creation. The concepts of learning, knowledge and information relate to one another in such a way that information acts as a meaningful input that generates the learning processes and constitutes the basis for acquiring knowledge. The discussion and reflection concerning these concepts and their relationships forges a link between the two concepts and integrates them into two aspects of the same reality: learning and knowledge creation. Here, learning is the process of creating knowledge and knowledge is something people learn (Moreno-Luzon & Lloria, 2008).

In an attempt to comprehend the concept of organizational learning, the first analysis is on the epistemological nature and ontological levels of organizational learning. In these two dimensions, one of the most influential contributions comes from Nonaka (1994). His model of knowledge creation forms the basis of many other studies (Chang, Hsu, & Yen, 2012; Nonaka & Takeuchi, 1995; Nonaka & Toyama, 2005; among others).

According to the epistemological dimension, Nonaka's model stems from the assumption that knowledge arises through the conversion between tacit and explicit knowledge. The knowledge creation process is a dynamic process consisting of four modes of knowledge conversion: (1) Socialization, from tacit knowledge to tacit knowledge; (2) Combination from explicit knowledge to explicit knowledge; (3) Externalization from tacit knowledge to explicit knowledge; and (4) Internalization from explicit knowledge to tacit knowledge (Nonaka, 1994: 18).

The second important dimension of Nonaka's model is the ontological one. The organization cannot create knowledge by itself. The tacit knowledge of individuals is the basis for creating organizational knowledge, but the organization must be capable of mobilizing this knowledge, which emerges and accumulates at an individual level, to other ontological levels. Mobilization takes place through the four modes of knowledge conversion and the ontological levels (individual/group/organization/inter-organization) generating a 'spiral of organizational knowledge creation' (Nonaka & Takeuchi, 1995: 73).

The ontological dimension, albeit without the inter-organizational level, figures in another very influential organizational learning theoretical model by Crossan et al. (1999), which later appears in research by many other authors like Bontis et al. (2002) and Choo and Bontis (2002). The most relevant characteristic of this model is the identification

of four learning processes. 1) Intuiting: a characteristic of learning at an individual level that implies the recognition of a pattern and/or possibilities stemming from personal experience. 2) Interpreting: serves as a bridge between individual and group levels, and consists of the explanation of an idea through words or actions. 3) Integrating: acts as a meeting point between group and organizational levels, and refers to the development of a shared understanding between individuals and undertaking actions that imply mutual adjustment. 4) Institutionalizing: belongs to the organizational level and refers to the introduction of routines that serve as a guide for individuals within the organization.

The three ontological levels—individual, group and organizational—interact with one another, thus underlining their dynamic nature. Therefore, the process of amplification from the individual right up to the organization constitutes the feed-forward process, in the same way that the downward process from organization to individual defines the feedback process. The constant ebb and flow between these two processes completes the definition of organizational learning as a dynamic process.

The distinction between organizational learning typologies is another relevant issue. A well-known typology, which is the origin of many other contributions and much academic debate, is March's differentiation between exploitation and exploration (March, 1991). March's concept of exploitation ties in with activities and learning through a specific search, fine-tuning and improvement of what already exists. The concept of exploration, on the other hand, involves learning through completely new processes, planned experimentation and play (March, 1991: 72).

In light of the search to find the most complete way of specifying the conceptual dimensions of organizational learning, the dimensions come from the creation of a battery of items from the literature to do with the four ontological levels, the different modes of knowledge conversion, the explicit and tacit dimension of knowledge, the sub-processes of learning, and the different types of learning. Thus, this approach should lead to an integrative and eclectic measurement of organizational learning.

2.2. Development of the scale: the creation of items

The first step in the scale's development process is the creation of a list of items which, when put together, make up the process that forms the target of measurement; in this case, organizational learning.

The final questionnaire includes the 18 items in Table 1. The arrangement of the items follows a Likert type response format, ranging from 1 (= entirely disagree) to 7 (= totally agree).

The following studies, focusing on the organizational learning process itself, offer relevant sources for determining the items to include in the scale:

- Nonaka, Byosiere, Borucki, and Konno (1994) and Chang et al. (2012) on the basis of the theoretical model by Nonaka (1994)
- Bontis et al. (2002), following the theoretical framework by Crossan et al. (1999)
- Pérez, Montes, and Vázquez (2004), and Tippins and Sohi (2003) on the basis of Huber (1991)
- Templeton, Lewis, and Snyder (2002) who develop their scale from their own theoretical perspective.

3. Psychometric properties of the measurement scale

3.1. Sampling and data collection

The selection of companies is from the Dun and Bradstreet database, which yields a large enough sample for the statistical requirements of this study. The subject and scope of the investigation is 1465 Spanish large companies. The sample size is 167 companies (with a reliability level of 95.5% and a margin of error of $\pm 7\%$).

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