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A novel taxonomy of organizational learning contextual factors: Review of 2004–2020 top-ranked journals

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Abstract

As a dynamic phenomenon that interacts across different levels – individual, group, organizational, interorganizational – the development of a unique multilevel theory of Organizational Learning (OL) is absent and challenging. The intent of this paper is to contribute to the advancement of such a theory. In this context, a systematic review of the 2004-2020 literature was carried out, with analysis of 120 papers selected from management and organization science top-ranked journals. Based on the conceptualization of OL as multiple processes of knowledge creation, transfer, and retention, the reviewed papers highlight that internal and external environments, organizational culture, strategy, structure, leadership, technology, and shared environments need to be considered for a comprehensive understanding of vertical trickle-down OL processes, and of bottom-up emerging OL processes, in both single and multi-level OL analyses. This study contributes to the theory of OL with the presentation of a novel taxonomy of contextual factors that could help researchers in the development of comprehensive OL studies. The implications offered should support the definition of a multilevel theory for OL that embraces all the relevant factors that influence its processes across the different organizational levels. The review closes with specific recommendations for further studies in OL.

Keywords: Organizational learning, contextual factors, multilevel theory, systematic review, knowledge management; organization science.

Introduction

Organizational Learning (OL) has generated interest in several academic fields, including psychology, education, management, strategy, production management, and organization theory. Further, learning can emerge from experience (Hoang & Rothaermel, 2010), specific conditions (Clegg et al., 2004), or interactions between the exploitation and exploration processes (March, 1991). In addition, learning can be found in knowledge-related processes, such as in the creation (Nonaka, 1994), transfer, and retention of knowledge (Argote, 1999, 2011). Over recent years, a series of successive reviews on this topic has been developed in academic journals to capture the evolution of the OL field (Easterby-Smith et al., 2000; Fiol & Lyles, 1985; Huber, 1991). Moreover, several authors have proposed frameworks, and theoretical contributions oriented at building a multilevel theory of OL, meaning a theory that encompasses OL dynamics inside and

across all the relevant levels, such as the individual, group or team, organizational and interorganizational levels (for example, Crossan et al., 1999; Lawrence et al., 2005; Soekijad et al., 2011). However, a comprehensive theory does not appear to be available (Basten & Haamann, 2018; Crossan et al., 2011), which is a challenge considering OL research is historically fractured into different foci and multiple levels of analysis (Bapuji & Crossan, 2004). In this context, the aim of this paper is to contribute to such deliberation by proposing a novel taxonomy of the contextual factors that influence OL processes, representing one of the first steps to building a comprehensive multilevel theory. This paper expands on previous conceptualizations of the topic, such as that of Fiol and Lyles (1985) where environment, corporate culture, strategy, and organizational structure were identified as OL contextual factors and (in the light of recent OL literature) Wenger's Community of Practice (1999), which refers to a shared environment widely analyzed in the context of learning studies. This paper presents a research instrument to identify the most critical factors that influence *trickle-down* vertical OL processes and to determine the impact on *emerging* bottom-up learning processes from lower to higher levels of OL. The next section highlights the theoretical background of this study, followed by a presentation of the systematic methodology used for paper selection and the related qualitative analysis. The "OL Contextual Factors: A novel Taxonomy" section then presents the taxonomy developed from the in-depth results of a qualitative analysis of the selected literature. The review concludes with limitations of this study and possible future avenues for research.

Literature Background

When studying elements that influence OL processes, the internal and external environments should be considered two of the most important OL contextual factors. On the one hand, considering each OL level to be "a whole, and a part of another whole" (Sessa et al., 2011, p. 3) informs identification of the internal environment as a set of structures, powers, and politics that characterize the organization at the intra and interorganizational levels. In fact, organizational systems largely influence embedded/hosted individuals and groups (Sessa et al., 2011) and indirectly influence associated interorganizational relationships. On the other hand, the external environment is defined here as the macro environment in which an organization is included. This comprises political, economic, social, technological, environmental, and legal factors (as in the PESTEL analysis, acronym that stands for Political, Economic, Social, Technological, Environmental and Legal factors analysis; for example, Yüksel, 2012), and competition (Porter, 1985). These environments affect OL processes differently and in relation to the diverse level of controllability possessed by the firm. Moreover, power and politics influence both the intra and interorganizational levels, while the external environment (macroeconomic and competitive factors) influences learning processes with limited controllability by the firm. As a separated factor related to the internal environment, organizational culture plays a critical role in the development and efficacy of learning processes, identifying a second category of contextual factors. In particular, formal cultural elements are as significant at the intraorganizational level (such as organizational rules) as at the interorganizational level (such as Research and Development (R&D) – alliances) in relation to OL processes. Further, pronounced relevance should be afforded to informal culture-related elements such as dialogic and communicative approaches (Santiago, 2020). Among the cultural factors, artefacts appear to represent a separate factor influencing OL,

given the vital applicability of both virtual and physical artefacts in creating the conditions for effective learning processes inside shared environments. Particular relevance is conveyed on abstract and physical artefacts, as critical cultural factors stimulating the occurrence of OL processes, especially in a bottom-up direction. As fourth factor, recent literature confirms that strategy is a relevant contextual factor in the context of OL (Fiol & Lyles, 1985). However, a particular distinction is made among two different strategic dilemmas: the exploitation-exploration tension, which is more focused on the attitude to exploiting existing knowledge, in contrast with a major propensity to innovate with new knowledge (March, 1991), as well as the external acquisition/internal development of the knowledge dichotomy, which is focused on the development of the required knowledge at the internal or external level (Russ et al., 2012). As the fifth factor, the influence of hierarchically higher organizational structures on learning processes is relevant, particularly in relation to the different configurations of lower levels (Kozlowski & Klein, 2000). The influence of these structures might assume different intensities in relation to the focus of the analysis (at the individual, group, or inter/organizational level), and its consideration in the overall system in which it is inserted (Sessa et al., 2011). Given the focus on the organizational level, the identification of structure, management, and processes influencing OL processes appear to be essential for a comprehensive representation of the phenomena (Fang, 2014; Pena & Curado, 2017; Scarbrough et al., 2004). Sixth, several recent contributions underline the role of leadership, mainly in relation to formal and informal occurrences at the intraorganizational and interorganizational levels. Further, formal directive and mediating actions and informal leadership styles and objectives (i.e. the concept of attentional learning) might enable or hinder learning processes at the intra and interorganizational levels. As the seventh factor, technology is able to influence the occurrence and effectiveness of OL processes, mainly in relation to collaborative forms of learning (for example, Dodgson et al., 2013). Further, synchronous and asynchronous technological processes and tools might create the conditions for interactions among different organizational actors, enabling the occurrence of knowledge creation and transfer processes. Finally, moving from the concept of the intraorganizational Community of Practice (CoP) (Wenger, 1991), the existence of both formal and informal shared environments appears to stimulate the occurrence of emerging learning processes at different OL levels. In the following sections, the previously-mentioned eight contextual factors are analyzed in greater depth by using the reviewed papers identified with the systematic methodology, contributing to a fuller understanding of the critical elements that influence OL processes.

Methodology

To analyze the recent literature on OL, a systematic approach was used for the selection of relevant papers among top-ranked and specialized journals on management and organization science (Easterby-Smith et al., 2015; Petticrew & Roberts, 2008), using explicit and reproducible methods (Greenhalgh, 1997). Further, it facilitates identifying a comprehensive state-of-the-art within a field when exploring for a research-worthy problem (Ellis & Levy, 2008), such as the identification of OL contextual factors that influence learning processes to instigate the development of a unique multilevel theory of OL (Crossan et al., 2011). The first data collection took place in May 2019 followed by September 2019 then January 2021, according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol (Moher et al., 2009). The 2004–2020

period was identified as extending the previous series of reviews (Bapuji & Crossan, 2004), with the most recent contributions being from 2020.

First, the keywords "organization* learning" and "organisation* learning" were searched for in the SCOPUS database to identify any papers that focused on OL in seven highly-ranked journals from the Association of Business Schools' Academic Journal Guide (ABS AJG) ranking. The asterisks were inserted in the search string to comprehend other possible declinations of Organizational Learning, such as "organizations learning" or "organization learning". These journals included the following: Academy of Management Journal, Academy of Management Review, Organization Science, Strategic Management Journal, and Organization Studies, Management Learning Journal (ML- focused on learning studies), and the Journal of Cleaner Production (JoCP). The research sponsor required inclusion of the latest journal, others were chosen based on the selection of journals used in previous OL reviews, while ML was incorporated for its specific contribution to the OL field.

Second, the 229 peer-reviewed and published papers identified in the data collection process were fully screened, read, and analysed. The full-text qualitative analysis was informed by the identification of top-down and bottom-up elements and processes able to affect the knowledge creation, transfer, and retention processes (Argote, 1999), in the light of previous OL literature. Eight contextual factors were identified as influencing the occurrence and intensity of OL processes: internal and external environment, organizational culture and artefacts, strategy, organizational structure, leadership, technology, and shared environments. After the full-text analysis, any paper that focused mainly on the conceptualization of OL or the role of time on OL processes, or those where OL was a non-relevant element of this study, were excluded from the analysis. Finally, a sample of 120 papers (52.4%) was included in this study and the related contributions organized in a research instrument—the taxonomy of OL contextual factors.

Contextual Factors of OL: A Novel Taxonomy

This research builds on the assumption that OL is a multilevel phenomenon that encompasses multidirectional knowledge-related processes, particularly the creation, transfer, and retention of knowledge (Argote, 1999, 2011). Given the potential for developing a multilevel theory in the future, once the object of investigation is defined it is essential to identify the levels involved and the top-down and bottom-up processes that link them together (Kozlowski & Klein, 2000). Accordingly, the OL levels are identified at the intraorganizational level (including the individual, group, organizational, and interorganizational levels) considering that dynamic OL processes might take place inside single levels and in the linkages. In this circumstance, the identification of critical contextual factors is relevant in two ways: first, in the analysis of top-down processes. These are also definable as trickle-down processes that are derived from higher levels and have effects on lower ones according to the quality of contextual factors involved in the process. Second, in the investigation of bottom-up processes. These are usually emerging processes from lower to higher levels in the contextual conditions that the investigated OL levels present (Kozlowski & Klein, 2000).

In both circumstances, the investigation of contextual factors facilitates the development of a more detailed understanding of OL processes, both at individual OL levels and in the intra-level

dynamics. From the qualitative analysis of the identified papers, the eight contextual factors presented in the previous section are validated and enriched by recent contributions from the literature, with a specific distinction made between the intra and interorganizational levels. The novel comprehensive taxonomy of contextual factors is summarized in Table 9, while the sub-levels and exemplary references are included in Tables 1–8.

Internal and External Environments

Organizations generally react and adapt to their environment by choosing appropriate organizational structures, strategies, and operations that will allow it to better adapt to environmental changes (Duncan, 1974). Accordingly, learning activities are also appended to environments that have different characteristics depending on the OL level considered. In this paper, a distinction is made between the internal and external environments.

The internal environment influences learning processes, defined in terms of the culture, structure, power, and politics that characterize the organization. Hence, the influence of culture on OL processes is investigated separately from the internal environment to which it conceptually belongs because of its significant relevance to the occurrence and efficacy of OL processes. Here, the main focuses are on the role of the construct of the internal environment, which mediates between top-down and bottom-up resistance to learning processes (Waring & Currie, 2009), and to overcome power relations that could pose an obstacle to their effectiveness (Fahy et al., 2014). Politics and power plays are the most relevant roles in the success of learning processes at the intraorganizational level (Collien, 2018; Ferdinand, 2004; Lawrence, 2005). Further, they require management to create a shared identity among organizational actors (Harman 2012). At the interorganizational level, a specific analysis of the role of power as a controlling instrument in the context of multinational companies hints at its importance and the association among different organizations (Whittle et al., 2016). Thus, this contextual factor is relevant to OL studies.

Table 1. Environments: External and Internal

Contextual factor	Sub-level	Intraorganization	Interorganization
Environment	Internal	Influence effectiveness of learning processes (Fahy et al., 2014; Waring & Currie, 2009), in relation to power (Collien, 2018; Harman, 2012; Lawrence, 2005), and politics (Ferdinand, 2004)	Influence of power and politics on the occurrence of learning processes (Whittle et al., 2016)
	External	Influence patterns of learning (Miller & Lin, 2010), and benefits (Garriga et al., 2013; Nagle, 2018; Uotila et al., 2009; Zhao et al. 2018)	Influence learning from acquisition process (Cuypers et al., 2017; Kim & Finkelstein, 2009; Muehlfeld et al., 2012; Rothaermel & Hess, 2007; Uhlenbruck et al., 2006), learning from networks (Manring & Moore, 2006; Strøm-Andersen, 2020), and external intermediary actors (Polidoro, 2020)

The external environment (macroeconomic factors) significantly influences the occurrence and effectiveness of learning processes at the intraorganizational level. Moreover, several studies have

highlighted how different patterns of learning might occur in firms in relation to the external environment and the epistemologies within organizations (Miller & Lin, 2010) and how this can benefit firms differently (Garriga et al., 2013; Nagle, 2018; Uotila et al., 2009; Zhao et al. 2018). At the interorganizational level, the relationship between the external environment (Porter, 1985) and the internal characteristics of a firm largely influences the learning capability of a single organization. Further, learning from acquisitions might be stimulated or limited (Muehlfeld et al., 2012; Rothaermel & Hess, 2007) in relation to the similarity and complementarity of firms (Kim & Finkelstein, 2009) or the strategy (Uhlenbruck et al., 2006) and information they possess (Cuypers et al., 2017). Further, the presence of external networks and external actors (such as regulatory agencies acting as intermediaries (Polidoro, 2020) could encourage a positive interaction among competences, notions, and perspectives, such as stimulating a sustainable development of network members towards a triple bottom line approach (Manring & Moore, 2006; Strøm-Andersen, 2020).

Organizational Culture

Among the internal environment factors, organizational culture refers to the collection of accepted elements inside the organization, such as core values, visible artefacts, and underlying shared assumptions (Schein, 2004). Organizational culture influences organizational activities and operations as learning processes (Fang et al., 2014). Some of the reviewed contributions focus on the role of culture, especially on underlying the relevance of formalized elements such as organizational rules (Kieser & Koch, 2008) and working spaces (Edenius & Yakhlef, 2007; Izak, 2015; Lee, 2019; Macpherson & Jones, 2008; Rowe, 2015) for specific learning outcomes. Further, informal elements play an important role in the effectiveness of learning processes, such as dialogue and narrative processes (Garud et al., 2011; Mengis & Eppler, 2008; Tourish & Hargie, 2012), sensemaking (Calvard, 2016; Dwyer & Hardy, 2016) mindfulness (Hernes & Irgens, 2013; Levinthal & Rerup, 2006), attention to silence (Blackman & Sadler-Smith, 2009), and diversity and emotions (Cortese, 2005; Vince & Saleem, 2004). Thus, both formal and informal cultural factors might stimulate or hinder the occurrence of effective knowledge processes (Smith & Elliott, 2007) and ambidexterity (Ossenbrink et al., 2019) at each OL level (Furlan et al., 2019), with specific studies focused on the individual (Kieser & Koch, 2008), team (Carroll et al., 2006), and organizational levels (Carlile, 2004; Szulanski et al., 2016).

At the interorganizational level, it is possible to extrapolate the role of culture from studies focused on the analysis of relationships between different organizations, such as in R&D alliances (Feller et al., 2013) and networks (Dyer & Hatch, 2006; Manring & Moore, 2006). The presence of formal connections might stimulate potential learning processes, such as "feedback-driven problemistic search" (Angus, 2019, p. 2015), which tends to occur more frequently when actors share a culture. From the informal side, the presence of boundary individuals (such as individuals with several interpersonal connections (Kauppila et al., 2011; Schilling & Fang, 2014) might stimulate learning processes as a consequence of open communication processes among different organizations' members.

Artefacts are another significant culture-related factor in the context of OL (Macpherson & Jones, 2008), which are analyzed mainly in relation to the concept of a shared environment. Artefacts are capable of influencing both trickle-down and emerging OL processes with the creation of a

common understanding of practices and processes, resulting in wider organizational culture acceptance in the context of OL. In this analysis, the role of artefacts is highlighted distinctively (in the context of a shared environment) as boundary elements that create the conditions for emerging learning processes at the intraorganizational and interorganizational levels. In summation, the study of culture in relation to OL processes remains a fertile avenue for research in this field as a relevant contextual factor that can influence occurrences of the creation, transfer, and retention of knowledge at intraorganizational and interorganizational levels.

Table 2. Organizational Culture

Contextual factor	Sub-level	Intraorganization	Interorganization
Organizational culture	Formal	Role of organizational rules (Kieser & Koch, 2008), working spaces (Edenius & Yakhlef, 2007; Izak, 2015; Lee, 2019; Macpherson & Jones, 2008; Rowe, 2015) for learning effectiveness (Carlile, 2004; Carroll et al., 2006; Kieser & Koch, 2008; Furlan et al., 2019; Smith & Elliott, 2007; Szulanski et al., 2016) and performance (Fang et al., 2014)	Relevance of R&D alliances (Feller et al., 2013), networks (Dyer & Hatch, 2006; Manring & Moore, 2006), and problemistic search (Angus, 2019) on learning and performance
	Informal	Role of dialogue and narrative processes (Garud et al., 2011; Mengis & Eppler, 2008; Tourish & Hargie, 2012), sensemaking (Calvard, 2016; Dwyer & Hardy, 2016) mindfulness (Hernes & Irgens, 2013; Levinthal & Rerup, 2006), silence (Blackman & Sadler-Smith, 2009), acceptance of diversities and emotions (Cortese, 2005; Vince & Saleem, 2004), and cultural openness for learning effectiveness (Carlile, 2004; Carroll et al., 2006; Furlan et al., 2019; Kieser & Koch, 2008; Ossenbrink et al., 2019; Smith & Elliott, 2007; Szulanski et al., 2016)	Presence of multi-connected individuals (Kauppila et al., 2011; Schilling & Fang, 2014)

Strategy

Organizational strategy orients operations, structures, and individuals in relation to environmental pressures and coherently with the cultural approach of an organization (Porter, 1985). Thus, following the conceptualization of Fiol and Lyles (1985), strategy should also be considered when analyzing learning processes. Following the initial definition by March (1991), a significant number of scholars have concentrated on the strategic balance between exploration and exploitation activities, also known as ambidexterity (Lane & Lubatkin, 1998). In particular, recent contributions have focused on how this ambidexterity affects the performance (Lichtenthaler, 2009), adaptability (Piao & Zajac, 2016), and specific related learning activities (Zahra & George, 2002), such as knowledge transfer (Holmqvist, 2004; Mariano & Casey, 2015), of different actors. A series of contributions focused on internal development (in contrast with external acquisition) (Russ et al., 2012). The concept of strategic attention and its derivatives, such as attentional learning (Rerup, 2009), attention capacity (Castellaneta & Zollo, 2015), and attention allocation (Hu & Bettis, 2018; Sullivan, 2010) are receiving particular consideration in relation to learning processes. Specifically, these studies underline the importance of prioritizing and considering

organizational activities (such as learning) in relation to the internal capacity, structures, and strategic objectives of the organization. Further, when exploring/exploiting the conceptualization of strategy at the interorganizational level, a strategic exploitation of partner experiences should enable learning processes across organizations (Gulati et al., 2009; Hoang & Rothaermel, 2010; Howard et al., 2016; Lavie et al., 2011).

Table 3. Strategy

Contextual factor	Sub-level	Intraorganization	Interorganization
Strategy	Exploitation/ exploration	Impact of exploration/exploitation activities (Lichtenthaler, 2009), on adaptability (Piao & Zajac, 2016), and on specific learning activities (Holmqvist, 2004; Mariano & Casey, 2015; Zahra & George, 2002)	Exploitation/ exploration of external relationships (Gulati et al., 2009; Hoang & Rothaermel, 2010; Howard et al., 2016; Lavie et al., 2011)
	External Acquisition versus Internal Development	Attentional learning (Rerup, 2009), attention capacity (Castellaneta & Zollo, 2015) and attention allocation (Hu & Bettis, 2018; Sullivan, 2010)	Specific exchange activities for external knowledge acquisition (Dekker & Van Den Abbeele, 2010; Tuschke et al., 2014), together with vicarious learning (Csaszar & Siggelkow, 2010; Schwab, 2007)

In relation to strategic external acquisition/internal development, learning can occur in relation to imitation processes in an explorative orientation (vicarious learning) (Csaszar & Siggelkow, 2010; Schwab, 2007) or as a consequence of specific exchange activities, such as board interlocks (Tuschke et al., 2014) or interfirm transactions (Dekker & Van Den Abbeele, 2010). From this perspective, the linkages among OL levels are intrinsically related at the intraorganizational level to the strategic orientation of the firm, which could be designed to enable the occurrence of learning processes across levels. Similarly, learning activities should be designed in accordance with the overall organizational strategy that determines their appropriate level of attention. In contrast, linkages among OL levels at the interorganizational level are often related to structured configurations of external relationships.

Organizational Structure

In the context of OL analysis, the organizational structure (subdivided into structure, management, and processes in this paper) necessarily influences organizational members (Dalton et al., 1980), and the firms' potential in terms of learning processes. At the intraorganizational level, a major focus can be observed in the reviewed papers on group configurations and dynamics (Carrol et al., 2006; Fang et al., 2010; Jain, 2013; Kane, 2010; Oshri et al., 2006; Putz et al., 2012), project-level learning (Rockart & Dutt, 2015; Scarbrough et al., 2004; Swan et al., 2010), and operational division/integration (Waisberg & Nelson, 2018) in relation to effectiveness of knowledge processes. At the interorganizational level, the presence of joint scientific processes (De Palma & Dobes, 2010) or consultancy projects with professional service firms (Wagner et al., 2014) can develop the right conditions for learning processes together with specific configurations of networks (Dyer & Hatch, 2006), partnerships, and sporadic relationships.

The critical roles of management and tools for effective learning processes are highlighted at the intraorganizational level through the identification of champions, stars, and sponsors (Chen & Garg, 2018; Lawrence et al., 2005; Roome & Wijen, 2006), experts (Brix, 2020), key managers (Macpherson & Jones, 2008), "gangers" (Macpherson & Clark, 2009, p. 556), middle and senior managers (Beck & Plowman, 2009; Waddell & Pio, 2015), or integrators in general (Hallen et al., 2020; Stan & Puranam, 2017). At the interorganizational level, key individuals such as "knowledge activists" (Kauppila et al., 2011, p. 395), "hubs" (Schilling & Fang, 2014, p. 974), consultants, and experts (Clegg et al., 2004; Csaszar & Siggelkow, 2010) can be critical for learning processes to occur.

Table 4. Organizational Structure

Contextual factor	Sub-level	Intraorganization	Interorganization
Organizational structure	Structure	Presence of formal group (Carrol et al., 2006; Fang et al., 2010; Jain, 2013; Kane, 2010; Oshri et al.,2006; Putz et al.,2013), Project (Rockart & Dutt, 2015; Scarbrough et al.,2004; Swan et al., 2010), and operational division/integration (Waisberg & Nelson, 2018)	Presence of scientific and consultancy projects (De Palma & Dobes, 2010; Wagner et al., 2014), networks (Dyer & Hatch, 2006), alliances (Feller et al., 2013)
	Management	Presence of integrators, champions, stars, and sponsors (Chen & Garg, 2018; Hallen et al., 2020; Lawrence et al., 2005; Roome & Wijen, 2006; Stan & Puranam, 2017), experts (Brix, 2020) key managers (Macpherson & Jones, 2008), "gangers" (Macpherson & Clark, 2009), middle and senior managers (Beck & Plowman, 2009; Waddell & Pio, 2015)	Presence of "knowledge activitsts" (Kauppila et al., 2011), "hubs" (Schilling & Fang, 2014), consultants (Clegg et al., 2004)
	Processes	HR practices (Arthur & Huntley, 2005; Kolympiris et al., 2019; López et al., 2006); quality management processes (Ferguson-Amores et al., 2005; Nembhard & Tucker, 2011); the development of reference groups (Haas & Park, 2010); training activities design (Pena & Curado, 2017) and business experiments (Aminoff & Pihlajamaa, 2020; Ganz, 2020; Nembhard & Tucker, 2011; Swart & Harcup, 2012; Wollersheim et al., 2015), especially for managers (Cortese, 2005; Faran & Wijnhoven, 2012; Grey, 2007; Oshri et al., 2006; Roan & Rooney, 2006; Shamsie & Mannor, 2013); organizational actors' attitude (Gaba & Dokko, 2016; Lawrence, 2018)	Presence of joint R&D projects (Feller et al., 2013), and transfer of good practices (Csaszar & Siggelkow, 2010) in alliances, use of Information and Communication Tools (ICT) (Michalski, 2014) in multinational corporations

With regard to organizational processes, specific activities can stimulate linkages across interorganizational OL levels. In particular, recent literature has highlighted the following processes: employee rotation and gainsharing policies (Arthur & Huntley, 2005; Kolympiris et al., 2019), other Human Resource (HR) practices (such as selective hiring, strategic training, and employee participation) (López et al., 2006), quality management processes (Ferguson-Amores et

al., 2005; Nembhard & Tucker, 2011), the development of reference groups (Haas & Park, 2010), training, coaching, practice dry runs, suggestion programs (Nembhard & Tucker, 2011; Swart & Harcup, 2012), and business experiments (Aminoff & Pihlajamaa, 2020; Ganz, 2020). Some contributions emphasize the design of learning activities being important (Pena & Curado, 2017), which should be conceived in accordance with those already in place (Wollersheim et al., 2015) and in relation to organizational actors' attitude towards reference people and routines to avoid potential learning traps (Gaba & Dokko, 2016; Lawrence, 2018). Managerial training has garnered interest among scholars (Cortese, 2005; Grey, 2007; Faran & Wijnhoven, 2012; Oshri et al., 2006; Roan & Rooney, 2006; Shamsie & Mannor, 2013), emphasizing its critical role and the possible instruments and activities that could be used for constant professional growth among managers. At the interorganizational level, some contributions have focused on analyzing processes in the context of alliances, such as the identification and transfer of best practices and good ideas through consultants and experts (Csaszar & Siggelkow, 2010), or joining R&D activities (e.g. Feller et al., 2013) that might link OL levels in the long-term. From a similar perspective, the use of ICT tools in the context of multinational corporations can also be considered as a structured learning-oriented process at the interorganizational level (Michalski, 2014). However, less is known about the processes in less formalized configurations of collaboration; hence, this under-explored area should be considered an avenue for further research on OL.

Leadership

From the review of the selected papers, two additional contextual factors would appear to be relevant in the context of OL: leadership and technology. Winston and Patterson (2006) defined a leader as follows: "a leader is one or more people who selects, equips, trains, and influences one or more follower(s) [..] and focuses the follower(s) to the organization's mission and objectives" (p. 7). From this integrative definition, it is possible to deduce how the perception of leadership at the intra and interorganizational levels is crucial in helping organizations to reach their objectives; hence, it has a critical influence on related learning activities.

Table 5. Leadership

Contextual factor	Sub-level	Intraorganization	Interorganization
Leadership	Formal		Leadership processes among organizations through networks of practice (Soekijad et al., 2011)
	Informal	Leadership styles of founders, top and middle managers (Gruber et al., 2013; Soekijad et al., 2011; Sun & Anderson, 2012), and "authentic leadership" (Mazutis & Slawinski, 2008; Vickers, 2011)	

In this regard, expanding on Fiol and Lyles (1985) with recent contributions in the literature, this study shows how leadership is capable of influencing OL processes both formally and informally. On the one hand, recent studies at the intraorganizational level underline how unformalized styles of the founders and top/middle managers (Gruber et al., 2013; Soekijad et al., 2011; Sun & Anderson, 2012) and the concept of authentic leadership (Mazutis & Slawinski, 2008; Vickers,

2011) are assuming a relevant role in the context of OL. At the interorganizational level on the other hand, Soekijad et al., (2011) integrates the 4Is model of Crossan et al. (1999) with the insertion of two additional formalized leadership strategies (brokering and buffering, or conducting and controlling) to support organizational learning through networks of practice. These references suggest how the concept of leadership needs to be further investigated, because it plays an important role in the connection between the intra and interorganizational levels.

Technology

Together with leadership, technology should be included with the contextual factors that influence OL processes. Here, technology means the technological competency of a firm (Tippins & Sohi, 2003), not a sector's level of technology (Porter, 1985). In this context, it is relevant to distinguish the analysis of this element from other organizational resources. This is because its relevance is increasing, particularly in relation to the evolution of processes, products, and organizations towards industry 4.0 (Vaidya el al., 2018) and with regards to the difficulties of a wide number of enterprises in their internal development and related learning processes (Baker et al., 2016). Further, the widely used taxonomy by Johansen et al. (1991) is useful for highlighting the different contributions and possible avenues for research on OL and technology. This classification differentiates between times and places to identify different groupware solutions for collaboration among actors.

Some contributions focused on the versatility of technological practices and instruments capable of supporting several operations (such as learning processes), mainly in the connection between OL levels (individual, team, organizational, and interorganizational). Some contributions in the OL literature particularly emphasize Information Technology-enabled (IT) learning mechanisms such as communication technology (e-mail), knowledge repositories of best practices and groupware, virtual communities of practice (Kane & Alavi, 2007), virtual worlds (Dodgson et al., 2013), and barriers and solutions for effective virtual knowledge transfer (Kieser & Koch, 2008; Salomon & Jin, 2010). All these contributions highlight the relevance of knowledge sharing to activate the creation, transfer, and retention of knowledge; hence, OL technology could contribute to or hinder these processes.

Table 6a. Four-Square Map of Groupware Options (Johansen et al.,1991), populated with OL contributions for collaborative learning solutions at the intra and interorganizational levels

Place / Time	Same	Different
Same	Communities of Practice (Kane & Alavi, 2007), virtual words (Dodgson et al., 2013)	Technology for knowledge creation and transfer (Kieser & Koch, 2008; Salomon & Jin, 2010)
Different	Communities of Practice (Kane & Alavi, 2007), virtual words (Dodgson et al., 2013), knowledge repositories (Kane & Alavi, 2007)	Communication technology (Kane & Alavi, 2007); technology for knowledge creation and transfer (Kieser & Koch, 2008; Salomon & Jin, 2010)

The cited technological practices and instruments could have an effect at the intraorganizational level (in the connection between internal structures for cultural, strategic, and operational objectives) and interorganizational level. This would create novel possibilities for learning processes to develop and contribute to organizational growth. In summation, technology would appear to be a critical factor in the context of OL that requires further investigation, particularly in relation to interorganizational relationships.

Table 6b. Technology

Contextual factors	Sub-level	Intraorganization	Interorganization
Technology	Same place, same time	Communities of Practice (Kane & Alavi, 2007), virtual words (Dodgson et al., 2013)	
	Same place, different time	Communities of Practice (Kane & Alavi, 2007), virtual words (Dodgson et al., 2013), and knowledge repositories (Kane & Alavi, 2007)	
	Different place, same time	Technology for knowledge creation and transfer (Kieser & Koch, 2008; Salomon & Jin, 2010)	
	Different place, different time	Communication technology – email (Kane & Alavi, 2007); technology for knowledge creation and transfer (Kieser & Koch, 2008; Salomon & Jin, 2010)	

Shared Environment

The previously mentioned contextual factors focused on the influence of specific factors in top-down OL processes, considering that learning is necessarily influenced by higher organizational systems. However, learning is also an emerging bottom-up process combined with composition and compilation processes. The former "describes phenomena that are essentially the same as they emerge upward across levels" while the latter "describes phenomena that comprise a common domain but are distinctively different as they emerge across levels" (Kozlowski & Klein, 2000, p. 15). Accordingly, the notion of communities is useful for framing the concept of OL as a bottom-up compilation process. Different classifications of communities can be found in the literature in relation to "the strength of a group's social bonds (i.e. its level of cohesion) and the extent of its intentionality (i.e. the demonstrated purposefulness of its efforts)" (Smith et al., 2017, p. 220), which are communities of interest, goal oriented communities, learner communities, and CoPs (Henri & Pudelko, 2003). These types of communities are defined by Wenger (2002) as "groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis" (p. 4). This highlights how shared intentions, practices, and knowledge are essential for member interactions. Further, in the context of CoPs, learning processes emerge from formal and informal low-level environments. Moreover, they can spread and evolve towards other communities and higher organizations, frequently with different characteristics (Wegner, 1999; Wenger et al., 2002).

Some recent papers have focused specifically on CoPs (particularly at the intraorganizational level) to confirm the relevance of this informal structure to knowledge transfer (Matusik & Fitza, 2012; Nicolletti et al., 2019; Styhre et al., 2006) for the presence of trust and identity among participants (Hong & O, 2009) coherently with the internal structure (Halliday & Johnson, 2010).

Further, CoPs are characterized by high levels of cohesion, trust, and group-oriented knowledge processes with a particular emphasis on shared practices; hence, they represent a fertile environment for intraorganizational OL processes. When analyzing OL, it is interesting to include the concept of informal shared environments with this concept as potential spaces of emerging learning processes at the interorganizational level. In this context, the concept of the interorganizational community of practice (Wenger et al., 2002; Pattinson et al., 2016) seems to be useful for defining those constructive environments where knowledge creation, transfer, and retention processes might take place among members of different organizations. Special kinds of more formalized shared environments seem critical in the development of bottom-up learning processes. In recent literature, interesting studies have explored how virtual teams (Kauppila et al., 2011), associations (Dyer & Hatch 2006; Holmqvist, 2009), networks, and multiple collaborations (Feller et al., 2013; McEvily et al., 2012; Vasudeva et al., 2015) can be considered potential sources of emerging learning processes across organizations. Recalling the previously mentioned organizational contextual factors, formal groups (Carrol et al., 2006; Fang et al., 2010; Jain, 2013; Kane, 2010; Oshri et al., 2006; Putz et al., 2013) and project teams (Rockart & Dutt, 2015; Scarbrough et al., 2004; Swan et al., 2010) might also be potential environments for bottom-up OL processes, depending on specific contextual characteristics and configurations.

Table 7. Shared Environment

Contextual factors	Sub-level	Intraorganization	Interorganization
Shared environment	Formal	Presence of formal group (Carrol et al., 2006; Fang et al., 2010; Jain, 2013; Kane, 2010; Oshri et al., 2006; Putz et al., 2013), Project (Rockart & Dutt, 2015; Scarbrough et al., 2004; Swan et al., 2010)	Presence of networks (Feller et al., 2013; McEvily et al., 2012; Vasudeva et al., 2015) Association (Dyer & Hatch, 2006; Weller, 2017), virtual teams (Kauppila et al., 2011)
	Informal	Presence of CoP (Halliday & Johnson, 2010; Hong & Fiona, 2009; Matusik & Fitza, 2012; Nicolletti et al., 2019; Styhre et al., 2006)	Presence of interorganizational CoP (Pattison et al. 2016; Wenger et al., 2002)

Artefacts

In relation to OL processes, a relevant role is played by artefacts (or boundary objects) that interpose and mediate symbolically among organizational members (Macpherson & Jones, 2008). Those factors can be useful when analyzing top-down influences among hierarchical levels and when investigating shared settings. An organizational artefact is essentially a cultural element, which is presented here to underline how it contributes critically to the creation of the conditions under which a shared environment might stimulate the occurrence and effectiveness of learning processes. In particular, several recent studies have focused on the need for abstract artefacts to develop shared conceptions effectively (Carlile, 2004), understand practice among different CoPs (Macpherson & Clark, 2009) or organizational units (Macpherson & Jones, 2008), and to create a common identity (Macpherson et al., 2010) at the intraorganizational level. These elements (shared conceptions, practices, and identities) are critical for the occurrence of OL processes among members, because a common environment and understanding facilitate the creation, transfer, and retention of knowledge among actors. Further, in the connection between different organizations,

artefacts can be identified in relation to symbolic physical instruments such as repositories of knowledge (i.e., templates) (Lawrence, 2020) that make data easily transferable among parties (Saka-Helmhout, 2009) and as training-oriented ICT tools (Swan et al., 2007) that can contribute to overcoming specific issues (such as power imbalances) (Michalski, 2014). There is lack of specific studies on the themes of abstract artefacts occurring at the interorganizational level and in the digital (virtual) space, similar to physical artefacts at the intraorganizational level and physical space. This suggests a potential avenue for OL research in relation to these cultural elements.

Table 8. Artefacts

Contextual factors	Sub-level	Intraorganization	Interorganization
Artefacts	Abstract	Artefacts for shared conceptions, understanding of practice, shared identity (Carlile, 2004; Macpherson & Jones, 2008; Macpherson & Clark, 2009; Macpherson et al., 2010; Michalski, 2014; Swan et al., 2007)	
	Physical		Artefacts as knowledge repositories (Lawrence, 2020; Saka-Helmhout, 2009), training-oriented ICT tools (Swan et al., 2007; Michalski, 2014)

Implications for Methodology

This section focuses on the implications of the developed taxonomy when analyzing multilevel knowledge-related OL processes (Argote, 1999; Argote & Miron-Spektor, 2011). The creation, transfer, and retention of knowledge are easily understandable as both top-down (trickle-down) and bottom-up (emerging*)* processes moving across the individual, group, organizational, and interorganizational levels. Further, the influence of contextual factors should be considered in two main directions: when analyzing each OL level as a single research object and when studying interrelations between OL levels. As a main implication when studying OL processes, all relevant levels need to be investigated as a single object in relation to their main intrinsic characteristics. For example, the team-level OL processes should be individually framed inside their organizational context in terms of formal and informal team characteristics, compositions, qualities, duties, and relationships between higher, lower, and horizontal organizational structures. In this investigation, contextual factors that affect a single level should be traced to obtain a more realistic representation of the dynamics.

Accordingly, the newly identified taxonomy (as summarized in Table 9) can act as a comprehensive guide for identifying the influencing forces at a single OL level. At the team level for example, the internal environment (specifically the organizational culture, strategy, and leadership) largely influences the trickle-down and emerging OL processes, together with the presence of organizational structures, technological facilities, and processes in addition to shared environments that might constrain or facilitate OL processes. The identification of all these aspects is essential to frame single-level OL processes in a more representative way without overlooking

the relevant situational characteristics and processes that influence them. This is consistent with the notion of "a whole, and a part of another whole" (Sessa et al., 2011, p. 3) mentioned previously.

Table 9. Proposed Taxonomy of Contextual Factors Influencing OL Processes

Contextual factor	Sub-level	Mainly relevant on trickle-down OL processes	Mainly relevant on emerging OL processes
Environment	Internal	X	X
	External	X	
Organizational culture	Formal	X	
	Informal		X
• Artefact	Abstract		X
	Physical	X	
Organizational structure	Structures	X	X
	Management	X	X
	Processes	X	X
• Shared environment	Formal	X	
	Informal		X
Strategy	Exploration- exploitation	X	
	External acquisition- internal development		X
Leadership	Formal	X	
	Informal		X
Technology	Same/ different time	X	X
	Same/ different place	X	X

The interaction between the single-level characteristics and forces are not sufficient to fully explain the phenomena. As a second main implication, investigating the identified contextual factors leads to the consideration of both internal and external forces that can both influence that level and be identified in relation to the other OL levels. On the one hand, those characteristics related to single team members (linked to the individual level) necessarily influence the occurrence and effectiveness of OL processes at the team level. On the other hand, team-related processes naturally affect the attainment of OL objectives at a higher level (i.e., the organizational and interorganizational levels.) Further, individuals are embedded in teams, which are in turn embedded in the organization, which is embedded in its formal and informal networks. Specifically, the organization is able to influence OL processes that might take place among other organizations (interorganizational level), acting as an embedded element (such as in networks and alliances), as an external force affecting joined OL processes (such as in network contracts), or inside a shared collaboration environment. Consequently, for single-level analyses and investigations into the linkages among levels, the identified contextual factors influence the trickle-down and emerging processes of the creation, transfer, and retention of knowledge, facilitating a comprehensive understanding of the phenomena. Table 9 presents a summary of the identified

contextual factors including identification of the sub-levels and the related influence on trickle-down and emerging processes, as implied from the analyzed literature.

From the methodological perspective, the presented implications would require conducting OL studies with a collection of relevant multi-level data from each OL level. In particular, the definition of single level characteristics and the identification of the relationships between the other levels in a specific context are essential for framing formal and informal OL dynamics. Following the definition of all the relevant OL levels at both the intraorganizational and interorganizational levels, the collection of data related to the identified taxonomy of contextual factors should lead to significant qualitative and statistical analyses in relation to OL processes.

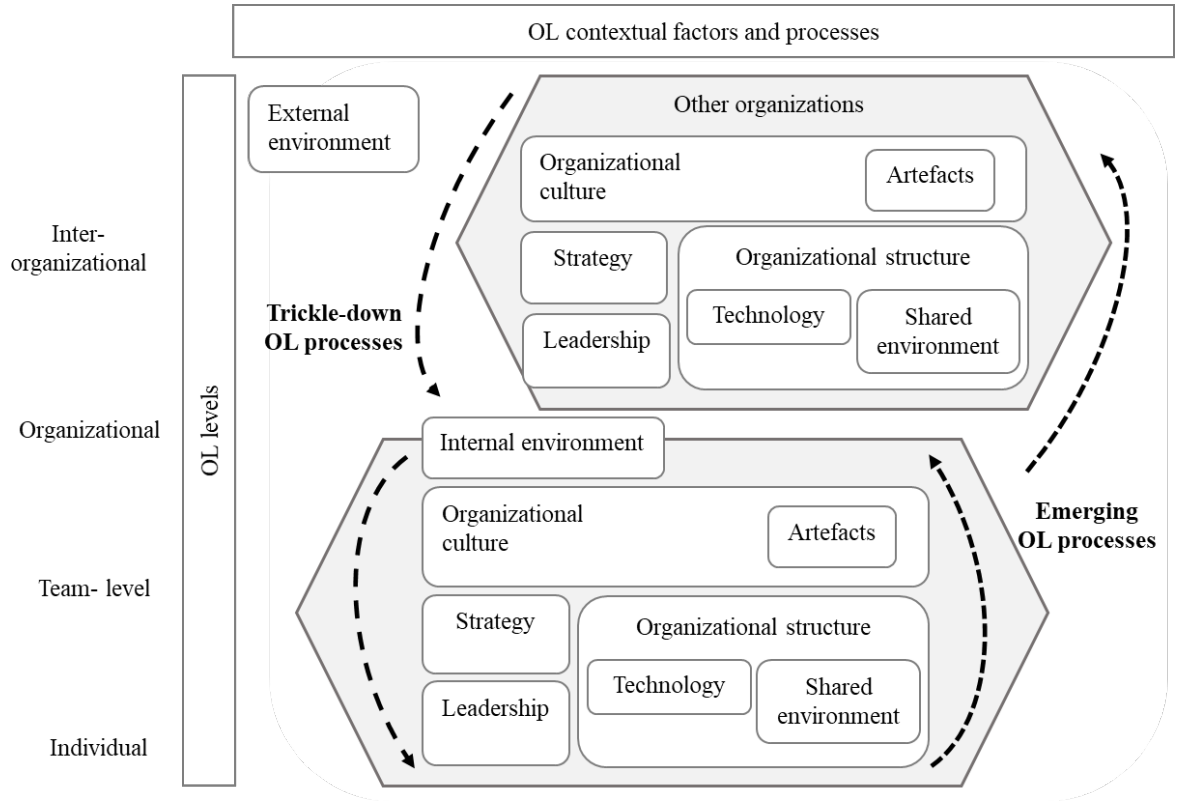

Figure 1. Influence of OL contextual factors on knowledge-related *trickle-down* and *emerging* processes on the individual, team, organizational, and interorganizational levels

Figure 1 presents a summary of the identified taxonomy of contextual factors moving across the individual, team, organizational, and interorganizational levels in addition to their related influence in the occurrence of trickle-down and emerging OL processes. Some of the identified contextual factors are partly explained by the quality of other contextual factors, such as artefacts being part of the main organizational culture feature and the shared environment being related to organizational structures. Therefore, it is relevant to identify the main characteristics of the broader element initially, then analyze the specific influence of one of its components in more detail if it affects OL processes. As previously explained, the external environment influences the

interorganizational, intraorganizational, and other levels with a cascade effect. At the organizational level, the internal environment (considered a set of structures, power, and politics) and organizational culture are the main elements influencing trickle-down and emerging OL processes. Other contextual factors can be considered as the manifestation of the culturally and environmentally-driven factors in relation to OL processes.

Considering the wider impacts of internal and external environments along with organizational culture on the occurrence of trickle-down and emerging OL processes, these factors should be analyzed initially as critical contextual factors, with investigation of other elements being framed accordingly. Further, technology and formal/informal shared environments should be examined concurrently with organizational structures, particularly in relation to emerging processes that spontaneously move from the individual to higher levels, while strategy and leadership should be considered when analyzing trickle-down OL processes.

Conclusions

The reviewed papers in recent management and organization science literature present several contributions to OL, confirming the relevance of the topic in high-ranked and specialized journals. In particular, a significant number of studies aimed to expand the understanding of the contextual factors influencing OL processes to facilitate the development of a comprehensive OL theory encompassing the individual, group, organizational and interorganizational levels, even though no previous studies have focused on identifying these factors explicitly. This study contributes to the continuous deliberation over OL in the academic literature with a taxonomy of contextual factors suitable for a comprehensive appreciation of OL phenomena using the conceptualization of learning as multilevel processes of knowledge-related processes (Argote, 1999, 2011). The developed taxonomy should help in recognizing all intraorganizational and interorganizational elements that can affect OL processes, identifying those mainly related to top-down (trickle-down) and bottom-up (emerging) processes. It seems particularly relevant that when developing a comprehensive multilevel theory, scholars should embrace all the presented context that might potentially influence learning processes across OL levels in their models. Accordingly, Table 9 and Figure 1 can be used as research instruments to recap the critical contextual factors to be considered in OL analyses and their specific influence in relation to individual, team, organizational, and interorganizational levels. This study has some limitations. The selection of papers was influenced by the decision to focus on a limited number of journals and by choosing a single database. On the one hand, the selection of journals was determined by those already used in previous reviews, which was expanded by incorporating specialized journals from ML and JoCP to capture particular orientations of studies on the topic. On the other hand, the use of SCOPUS appeared sufficient to cover the selected journals considering it contains all the chosen sources, including the latest publications (Elsevier, 2020).

With respect to the proposed taxonomy and the reviewed papers, further research should use different journals and databases to validate the relevance of the proposed taxonomy or prospect its refinements inside specific contexts. In addition, future studies should expand the understanding of specific areas. First, the role of culture in interorganizational relationships requires further investigation, particularly the identification of formal and informal elements that should be

managed for the creation of a collaborative environment suitable for learning processes to occur. Second, adding to the widely explored area of alliances, qualitative and quantitative studies should expand the understanding of short-term partnerships and temporary collaborative relationships. The proposed studies might benefit from the wide number of studies conducted at the intraorganizational level, which could help when interpreting the most critical factors, processes, and instruments that should be considered in the context of a shared environment across organizations. Emerging OL processes would also be useful as a focus of attention. These emerging processes might present specific characteristics at a team level then lose them when moving to the individual or organizational levels (Kozlowski & Klein, 2000). Accordingly, the influence of virtual artefacts and boundaries should be examined in greater detail in future studies to expand the understanding of the dynamics among OL levels and the role of cultural elements in the process. Finally, an in-depth analysis of the properties of emerging processes at each OL level would help when identifying the marginal role or significant relevance of contextual factors in relation to OL levels.

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