

The journey of team learning since “The Fifth Discipline”

Teresa Rebelo and Paulo Renato Lourenço

Faculty of Psychology and Education Sciences, University of Coimbra,
Coimbra, Portugal and CeBER, Centre for Business and Economics Research,
Coimbra, Portugal,
and

Isabel Dórdio Dimas

Faculty of Economics, University of Coimbra, Coimbra, Portugal and CeBER,
Centre for Business and Economics Research, Coimbra, Portugal

Abstract

Purpose: This paper is focused on team learning, the fourth discipline proposed by Senge (1990) in his seminal book *The Fifth Discipline: The Art and Practice of the Learning Organization*. It aims to provide a reflection upon the journey that this construct has made since this book’s publication, in terms of conceptualization, research and its link to organizational learning and learning organizations.

Approach: This paper is based on a review of Senge’s (1990) conceptualization of team learning and on a literature review of team learning research that has been produced since then.

Findings: Since the first edition of Senge’s book in 1990, team learning has been growing as an autonomous research topic with numerous articles centered on learning at this level of analysis. Senge’s proposals concerning team learning remain present in the way team learning is now conceptualized, but this research stream has led to advancements in its conceptualization and on the understanding of its antecedents and consequences. Nevertheless, we observed a lack of research centered on the link between team learning and organizational learning as well as between team learning and the concept of the learning organization.

Originality/Value: This paper offers a review of research on team learning, suggesting some avenues for further research on this topic and its contribution to learning organizations. Since teams are nowadays the building blocks of most organizational structures, and learning is a key process for effectiveness, research on learning at this level of analysis will remain valuable.

Keywords: team learning, organizational learning, learning organization, Senge.

Introduction

This paper is focused on team learning, the fourth discipline proposed by Senge in his seminal book on learning organizations, *The Fifth Discipline*. Since the first edition of this book, published in 1990, team learning has been growing as an autonomous research topic with numerous articles centered on learning at this level of analysis. This stream has led to advancements in the way team learning is conceptualized and on the understanding of its antecedents and consequences. Thus, the central aim of this paper is to reflect upon the journey that this construct has made since Senge's (1990) view of team learning, in terms of conceptualization, research and its link to organizational learning and the concept of learning organizations¹. To do so, we start this paper with an overview of Senge's perspective on team learning and then we move on to an overview of the team learning literature and its development. In the third section, we reflect upon how much of Senge's perspective is reflected in the current conceptualizations of team learning, as well as looking for empirical evidence of some team learning conditions that we have identified in Senge's (1990) perspective. A glance of current conceptualizations and research on other antecedent variables is also provided. We finish this paper with some reflections on the disconnect between team learning and organizational learning and learning organization literatures, with clues for further research and with some challenges for the practice of team learning.

Team learning as proposed by Senge: an overview

Along with personal mastery, mental models, shared vision and the integrative discipline of systems thinking, team learning is presented by Senge (1990) as a crucial dimension for building learning organizations. Preceded by two examples of teams whose members know how to effectively play together (Boston Celtics basketball team and jazz musicians), Senge defined team learning as "the process of aligning and developing the capacity of a team to create the results its members truly desire" (1990, p. 236).

One of the features of team learning that Senge highlights is its collective nature, which is different from individual learning in teams. This is the reason why he proposes the practices of dialogue and discussion as fundamentals for achieving team learning. Grounded on David Bohm's work on the theory and practice of dialogue, Senge defines dialogue as a free and creative exploration of issues, which implies listening to one another and suspending one's own views and assumptions. Dialogue also implies "that everyone involved must truly *want* the benefits of dialogue more than he [sic] wants to hold onto his [sic] privileges of rank" (1990, p. 245, emphasis in original). Differently, in discussion, individual views are presented and defended in order to find the best way to decide. Dialogue and discussion are two distinct means of communication in a team, but they are both important to team learning. Thus, in order to benefit from these two types of conversation, teams should master the practices of dialogue and discussion and have the skill to distinguish them in order to move consciously between the two. To learn, teams have to learn that discussion is useful to the decision-making process when an agreement

has to be reached and a decision has to be taken; and that dialogue aims to discover a new and richer view of complex issues. Thus, balancing dialogue and discussion are vital for learning teams. As Senge so aptly concludes, “a learning team masters movement back and forth between dialogue and discussion. The ground rules are different. The goals are different. Failing to distinguish them, teams usually have neither dialogue nor productive discussions” (1990, p. 247).

Conflict and defensive routines are also highlighted by Senge (1990) as processes that impact on team learning. A team that learns has a conflict of ideas and is not afraid of living and dealing with it, thus avoiding team phenomena like groupthink (Janis, 1972). Defensive routines are “entrenched habits we use to protect ourselves from the embarrassment and threat that come with exposing our thinking” (p. 250). Based on Argyris (1985), Senge argues that this kind of routines are themselves a response to a problem. When the problem implies a need to learn, if learning is perceived as a threat by team members, they respond to this need in a defensive way. This defensive way of dealing with learning leads to an action on the symptom of the problem (learning gap) and not on the problem itself, creating a “symptomatic solution”, i.e., the reduction of the perceived need for learning. In other words, the reduction of the perceived need for a new understanding and new behaviors to face the problem. While divergence of ideas positively impacts on team learning, defensive routines not only impair the emergence of conflict of ideas but also team learning in general. Reflection and inquiry skills, as well as a team learning climate for defusing defensiveness are essential to allow learning in teams.

In relation to the fifth discipline – systems thinking – the systemic perspective and mastering the tools for thinking systemically are central in learning teams, as well as central in learning organizations. This is particularly relevant in teams that deal with complex and dynamic processes and realities (such as management, project or commercial teams). Senge (1990) addressed a tendency that we continue to see happen not only in the practice (in teams, in organizations, in leadership), but also in the research field: to approach and deal with complex and dynamic realities using linear mental models, that in turn, lead to intervention or research linear cause-effect designs. The tendency to use linear approaches to deal with complex realities manifests even when the dynamic complexity is recognized and accepted by those who are in the scenario. This tendency causes a mismatch between the problem (complex and dynamic) and the solution (simple and static). Thus, a systemic view of the situation that the team faces is needed. This means viewing the issue as a whole, as a complex system itself, in order to identify the interconnections between the different parts, looking at different perspectives to see more clearly how it unfolds over time, and to see which are the leverage points that can be changed, and which are beyond the control of the team. In this way, systems thinking is a core skill of learning teams. To develop this skill, Senge proposes that a systemic language should be developed in the team. When team members are dealing with complexity, systemic language helps the use of systems thinking, because the conversation is oriented to system features, such as the structure of the problem, the different forces at play and the interrelations between the

different components of the problem, instead of being focused on one single part at a time or just being focused on one thing the whole time of the conversation.

To finalize this brief overview, we highlight the fact that Senge defends team learning as a team skill, so it can be learned and mastered. Making use of different kinds of teams as examples (such as basketball teams, symphony orchestras, advertising teams), Senge (1990) argues that team learning requires regular practice in learning together. Such regular practice implies behaviors like rehearsing, experimenting, testing and reflecting on errors and failures. Furthermore, teams should also practice systems thinking and learn the language of this approach, which occurs through use, like any other language.

What happened to the “fourth discipline”?

In spite of offering relevant clues for mastering team learning, also in Senge *et al.*'s (1994) field book, Senge (1990) recognized that this process was scarcely understood and claimed for more theory and research to ground reliable methods for building teams that learn. This call was answered by the research community, with the growth of team learning as a research domain, boosted by the fact that teams became more and more omnipresent in organizations worldwide as a way of structuring their activities (Mathieu *et al.*, 2014). In fact, because teams are created with the aim of generating value for the organization, research on the conditions and processes that foster team effectiveness has received increasing attention (Mathieu *et al.*, 2017). Team learning has been one of the elected processes in terms of team effectiveness research, justified by a continuous empirical support of its positive relationship with several indicators of team effectiveness.

Research explicitly focused on team learning emerged as a topic in the management literature in the 1990s and expanded in volume and variety in the early 2000s and beyond. Just as Decuyper *et al.* (2010) pointed out, the number of references to team learning in the literature had continuous growth in the last decades, from one reference in the 1960s to 214 references in the period 2000-2007. This research body was built upon the research into organizational learning in the management literature and as a complement to it (Edmondson *et al.*, 2007). In fact, references to learning at the team level frequently appear in organizational learning and in the learning organization literature. For example, according to Marquardt (1996), in a learning organization, the three levels of learning (individual, group and organizational) complement and invigorate each other; team learning is one of the levels of the Dimensions of Organizational Learning Questionnaire (DLOQ), created by Watkins and Marsick, in 1997 (Marsick and Watkins, 2003). However, in this literature domain, despite the references and the recognized role of teams as learning units, the focus is not the groupⁱⁱ, but the organizational level. Thus, a gap in the literature came to be filled with studies specifically centered on learning at the team level, creating a growing and distinct area of inquiry, fertilized by the interest of different domains, such as management, educational sciences, work and organizational psychology, small group research, etc.

Regarding the evolution of the team learning conceptualization, the interdisciplinary attention to this topic has fostered rapid growth and diversity in perspectives, but it has

become problematic, due to a lack of integration (Decuyper *et al.*, 2010). Despite the coexistence of different definitions of team learning in the literature (for instance, these authors encountered 30 different definitions in their literature review), we can identify some definitions that are recurrently cited. Among these, we encounter the one by Argote *et al.* (2001, p. 370) that defines group learning

“in terms of both the processes and outcomes of group interaction. As a process, group learning involves the activities through which individuals acquire, share and combine knowledge through experience with one another. Evidence that group learning has occurred includes changes in knowledge, either implicit or explicit, that occur as a result of such collaboration”.

This definition is a broad description but, in our view, it is very useful because it encompasses the two perspectives by which the literature has been looking at the construct. As a process, team learning is anchored in a set of learning behaviors that occur in members' interaction, through which, for instance, they collectively identify, discuss and solve problems to provide solutions (Bunderson and Sutcliffe, 2003) or by which team members acquire, share, refine or combine task-relevant knowledge (van der Vegt and Bunderson, 2005). When team learning is conceived as a result of group interaction, authors look for outcomes that emerge as a collective property of the team, such as new collective work processes (Zellmer-Bruhn and Gibson, 2006), relatively enduring changes in knowledge, skill, or behaviors (Sessa *et al.*, 2011) or mutually shared cognitions that are built through members' participation in team learning activities (van den Bossche *et al.*, 2006).

In spite of also recognizing that the literature on team learning has grown with a high degree of confusion and a lack of cross-fertilization, Edmondson *et al.* (2007), in a useful literature review, identify three main areas of research, based on the review of empirical studies from three research traditions: learning curves (outcome improvement), lab experiments on team members coordination of task knowledge (task mastery) and field research on learning processes in real teams (group process). According to these authors, the first one has its roots in the research on new processes in manufacturing and service operations and its primary concern is the rate at which groups improve their efficiency, conceptualizing learning as performance improvement or efficiency improvement. The second body of work relies on social psychology experiments and it is centered on questions related to the coordination of knowledge, skills and action to better perform interdependent tasks, conceptualizing learning as task mastery. The third branch emphasizes group processes, their antecedents and consequences, and as one of its central concerns are questions related to what drives learning-oriented behaviors in organizational work groups. Team learning is conceived as a process and it has, in general, team effectiveness indicators as dependent variables. This third body of work usually relies on samples of real teams in organizational contexts. These characteristics lead us to base the

next section of this paper on this branch, where an attempt to make a bridge between Senge's (1990) proposal and later research on team learning is carried out.

Tying Senge's vision with later conceptualizations and research on team learning

Among authors who investigated team learning as a process, "there is general agreement that the exchange of information between team members is a key activity" (Boak, 2014, p. 244), and that it involves activities of collective information processing and reflection (Caniëls and de Jong, 2018). Thus, despite the lack of consensus that exists around which behaviors are included in the team learning process (Boak, 2014), "all appeared to refer to an ongoing process of collective reflection and action" (Savelsbergh *et al.*, 2009, p. 581). From these consensual points, we can observe that the collective nature of team learning, so highlighted by Senge (1990), is preserved in the way team learning is conceived nowadays. Interestingly, we can see from these consensual points that conversation between team members is still pointed out as a key activity, and that dialogue and discussion, two distinct but both important ways of communicating in teams to achieve team learning are, to some extent, also present: dialogue in reflection, through the idea of "thinking together" (Senge, 1990, p. 10) and discussion (relevant for finding the best way to decide and act) in action.

In order to have a thorough view of how much of Senge's team learning proposal is present in the way team learning is now conceptualized, we have to take a closer look at which behaviors or activities that lead to team learning. In this regard, one of the most quoted definitions of team learning as a process generated by a set of learning behaviors is from Edmondson (1999, p. 353), which precisely defines team learning "as an ongoing process of reflection and action", explaining that it is "characterized by asking questions, seeking feedback, experimenting, reflecting on results and discussing errors or unexpected outcomes of actions". Some authors, like Savelsbergh *et al.* (2009), opted for this definition because it allows the identification of five distinct and concrete learning behaviors through learning being enacted at the group level. Furthermore, this conceptualization has served as a basis for other authors to come up with more specific and elaborated definitions of these learning behaviors in their research (Savelsbergh *et al.*, 2009). By conversational actions team members explore and share knowledge and try to constructively manage differences in opinion; by seeking feedback, both internally and externally, members evaluate the team's performance and seek for improvements; by experimenting with behaviors, they try new strategies to achieve team objectives; by reflecting on past achievements and on future aims, they adapt or improve methods, strategies, or assumptions; and by discussing and reflecting on errors, they figure out ways to prevent them.

These key learning behaviors (exploring and construction of meaning, seeking feedback, experimenting, collective reflection and error management) were already reflected in Senge's (1990) chapter on team learning through the emphasis on reflection and inquiry skills as foundations for dialogue and discussion, as well as their importance for defusing defensive routines that jeopardize learning. Senge (1990) also mentions that

the regular practice of team learning involves experimenting, rehearsal and learning from errors.

Another quoted conceptualization of team learning is that of Decuyper *et al.* (2010). These authors propose that “team learning is both about knowledge acquisition (sharing, storage and retrieval), participation (boundary crossing, team activity and team reflexivity) and creation (co-construction and constructive conflict) (p. 116). Derived from the integrative work carried out by these authors, the election of these team learning processes and behaviors is anchored in several other authors, including Senge (1990). We can also notice here the presence of the relevance of conversational actions (such as, dialogue, sharing of information, framing, reframing); reflection; constructive or productive conflict; and building a shared vision. Team activity, which “is about learning by doing” (Decuyper *et al.*, 2010, p. 118), encompasses learning behaviors such as experimenting, rehearsal and practice, and boundary crossing relies on the idea of teams as an open system, so this leads not only to learning behaviors such as feedback seeking, but to the need for system thinking in learning teams.

Summing up, from consensual points and from two examples of quoted conceptualizations (one of them based on an integrative work) we can observe that Senge’s view is present in the way the process of team learning is now described. Yet, we also observe an effort of subsequent authors to refine the conceptualization of team learning, through the operationalization of distinct and concrete learning behaviors that help to better understand how teams could learn by conversational actions and members’ interactions, and by the addition of other team activities not so strongly addressed by Senge (1990), such as knowledge storage and retrieval.

However, if we reflect upon Senge’s (1990) definition of team learning – “the process of aligning and developing the capacity of a team to create the results its members truly desire” (p. 236) –, we notice that this definition is broader and goes beyond what we are discussing so far. It refers to developing a shared vision and to the existence of talented individuals, but these two ingredients are not enough to build a learning team, “what really matters is that [team members] know how to *play* together” (p. 236, emphasis in original). In our perspective, this definition of the process of team learning (that leads to the creation of a learning team) fits the definition of an effective work group. A work group is a social entity composed of members with high task interdependency and shared and valued common goals (Dyer, 1984). In line with the sociotechnical approach, Lourenço and Dimas (2011) regard groups as complex systems composed of two subsystems, the task system (members working together to reach common goals) and the socio-affective system (the social and affective needs of members that compose the group). Thus, the team’s effectiveness will depend on its ability, its alignment to meet the objectives and the needs of its members. So, in our view, what Senge (1990) reinforces with this definition is that the ultimate goal of team learning is making the team more effective, in other words, team learning is the key to members knowing how to play together, functioning as a whole, to achieve their goals.

As we have already mentioned, research focused on the process of team learning seeks to understand its antecedents and consequences, so questions related to what drives learning-oriented behaviors and what their outcomes (such as team effectiveness) are central concerns (Edmondson *et al.*, 2007). And, indeed, the relationship between team learning and indicators of team effectiveness is nowadays empirically supported in different team samples from different organizational contexts (e.g., Chan *et al.*, 2003; Kostopoulos and Bozionelos, 2011; van den Bossche *et al.*, 2006; Wong, 2004; Zellmer-Bruhn and Gibson, 2006).

In respect to the antecedents of team learning, research has been providing empirical evidence regarding several variables. Since the objective of this section is to tie Senge's (1990) proposal to later research on team learning, we opted for focusing the research on conditions we were able to identify on Senge's work.

Senge (1990) pointed out interpersonal trust as a crucial dimension for the achievement of coordinated actions, of collegueship, and of dialogue. And research already carried out supports a positive relationship between team trust, i.e., the trustworthiness perceptions that the team members possess in relation to each other (Langfred, 2004) and the team learning process (e.g., Carmeli *et al.*, 2012).

Reference to the importance of building a learning climate in the team is also made by Senge, namely to break down defensiveness postures. A particular kind of team climate is addressed by Senge as a facilitator of team learning, a climate where members don't need to feel defensive, don't avoid issues or don't need to protect ourselves. This description leads to the construct of team psychological safety, coined by Edmondson (1999), a team climate "characterized by interpersonal trust and mutual respect in which people are comfortable being themselves" (p. 354) and in which risk taking is safe. Team psychological safety has captured the attention of research on team learning and evidence that it constitutes a facilitator of the team learning process is provided by several studies (e.g., Edmondson, 1999; Kostopoulos and Bozionelos, 2011; Wong and Tjosvold, 2010).

Senge (1990) also defends the presence of a facilitator of the dialogue process. The way the duties of this facilitator are described, as well as the idea that the role of the facilitator became less relevant as teams gain experience and skills in dialogue, lead us to team leadership and to which attributes and behaviors a team leader should have to favor team learning. Concerning team leadership, we can also find research in the literature on its relationship with team learning (e.g., Koeslag-Kreunen *et al.*, 2018; Li and Zhang, 2016; van der Haar *et al.*, 2017).

Other facilitators of the team learning process have been studied in the body of research on team learning. In the review by Decuyper *et al.* (2010), research on the influence of cohesion, team potency, team structure and composition, team learning orientation and organizational support, to name a few, was mentioned. And more recent research is adding evidence to the relationships of other variables with team learning, such as team psychological capital (e.g., Rebelo *et al.*, 2018) or team virtuality (e.g., Ortega *et al.*, 2010).

To sum up, research on what influences team learning has provided empirical evidence of some conditions that Senge (1990) highlighted, but has gone beyond this, exploring other antecedent variables. Our perspective is that this body of research could help practitioners to intervene in teams in order to enhance their learning capability. It could serve learning organization researchers by contributing empirical evidence on what drives learning in these organizational units.

Conclusions, limitations and suggestions for further research

In this paper, we attempted to reflect upon the journey that the knowledge on team learning has made since Senge's (1990) proposal. This work led to three major conclusions. The first one is that many ingredients of Senge's conceptualization of team learning are preserved in current conceptualizations of team learning, namely the fundamental feature that team learning is based on conversational actions. Nevertheless, subsequent work on team learning has refined the definition of team learning, by decomposing the process into distinct and concrete key learning behaviors. The second conclusion is that the body of research centered on team learning has been providing empirical evidence for the idea that a team that is capable of learning is an effective team. In addition, research centered on what drives team learning has been carried out, providing empirical evidence for some conditions that Senge (1990) had already highlighted and adding evidence for other drivers (or impairments) of team learning. These two advancements on team learning research, in our view, contribute to a better understanding of how teams could learn and could help practitioners to promote team learning in organizations.

The third conclusion this work allows us to make is that, basically, we have now two literature and research streams, that produce and reflect on learning in organizational contexts based on different theoretical frameworks and foci, and that tend to publish in different journals, side by side, but in an independent way. For instance, it is easier to find papers on team learning in journals centered on group research or in organizational and management sciences journals than in journals centered on organizational learning and learning organizations, such as *The Learning Organization* journal. Senge, in 1990, had already recognized that teams were becoming the key learning units in organizations, thus justifying the choice of team learning as one of the fifth disciplines for building learning organizations. However, this bridge that Senge presents from team learning to organizational learning and to the learning organization concept has not been considered as a topic of interest in most literature centered on team learning. On the other hand, although we can find learning organization models that include team learning as a learning level in organizations (e.g., Morland *et al.*, 2019; Yeo, 2002), the literature on organizational learning and on the learning organization that specifically focuses on team learning as a topic of interest is scarce.

This current "state of the art" almost makes us forget that team learning was indeed proposed by Senge (1990) as a crucial element for building organizations that learn. Also, it leads us to call for a cross-fertilization of these two literature streams. Since teams are open

and complex systems (e.g., McGrath *et al.*, 2000), the literature on team learning would benefit from literature on organizational learning and learning organizations because it would bring and reinforce the multilevel perspective that research on team learning should adopt. Learning organization literature and practice would benefit from literature on team learning because, not only would it contribute towards a better understanding of learning at the team level, but it could also stimulate the advancement of knowledge on the link between team and organizational learning. According to Senge (1990), learning at the team level is relevant for learning at the organizational level because when “teams learn, they become a microcosm for learning throughout the organization” (p. 236). Skills developed and insights and achievements reached by a team that learns could be propagated to other teams and to the organization, and, what is more, could “set the tone” and establish a learning standard for the organization. We found little literature (but see, e.g., Alcover and Gil, 2002; Crossan *et al.*, 1999; Edmondson, 2002; Tanyaovalaksna and Li, 2013) discussing and investigating how team learning translates into organizational learning. Thus, one interesting and necessary clue for the future is to contribute to the understanding of the differences and the interdependency of team and organizational learning.

For our final remarks, we return to two relevant features of Senge’s (1990) work: team learning as a team skill and system thinking. We are in agreement with Senge (1990) that team learning is a team skill, and that it should be mastered as such. To be mastered, teams should practice, so they have to learn how to learn, by conversational interactions (dialogue and discussion), by practice of learning behaviors, by learning system thinking tools and language. The practice of team learning takes time and requires “psychological availability” from team members. In other words, to master team learning, members must have time and, moreover, have to feel that they can allocate time to team learning. However, is not one of the major obstacles for building a learning team the current pressure to take decisions, to achieve goals in short deadlines, to learn and innovate faster than the competitors? Are not coercive persuasion to learn (Schein, 1999) and a culture that compels learning (Marsick and Watkins, 1999) also current dangers arising from misrepresentation of the learning organization concept? Even living in the era of Industry 4.0, where big data, information and collaborative technological tools facilitate teamwork, the learning process needs time and availability. Thus, in our view, a current challenge for management is precisely to be aware of these needs and give teams room for transforming themselves into learning teams.

System thinking is a crucial dimension for building learning teams and learning organizations (Senge, 1990). The relevance of system thinking is rooted in the assumption that teams and organizations are complex systems. Teams as complex adaptive systems are open systems that interact with smaller systems (such as the members) and larger systems (e.g., organizations) within which they are embedded; and they are inherently dynamic systems, that change as a function of changing conditions over time (McGrath *et al.*, 2000). Therefore, team learning necessarily implies a systemic perspective of the circumstances in order to perceive the interconnections in play and to see more clearly how things unfold

over time. Hence, we reinforce the need for training organizational teams in system thinking.

In terms of team learning research, understanding teams as complex adaptive systems highlights the importance of framing team learning into a dynamical perspective and leads to the recent call for including change and time in research designs (e.g., Navarro *et al.*, 2015). This call has been answered recently by several authors (e.g., Dimas *et al.*, 2019; Rebelo *et al.*, 2016; Wiese and Burke, 2019; the special issue of *Small Group Research* edited by Lehmann-Willenbrock, in 2017, that comprises Molenaar and Chiu's, 2017; Wang *et al.*'s, 2017; Zoethout *et al.*'s, 2017; and van der Haar *et al.*'s, 2017, studies), and remains a relevant avenue for further research.

Like any work that is built on literature review and on reflection, the major limitation of this paper is that it is not exempt from the authors' mental models that impact the way they choose and interpret the literature. Despite this intrinsic limitation, we hope that this paper is able to reinforce the well-deserved recognition of Senge's work on team learning and would help to rejoin team learning and the concept of the learning organization.

References

- Alcover, C. and Gil, F. (2002), "Creating knowledge jointly: organization and group learning", *Revista de Psicología del Trabajo y de las Organizaciones*, Vol. 18 No. 2/3, pp. 259-301.
- Allen, N. and Hecht, T. (2004), "The 'romance of teams': toward an understanding of its psychological underpinnings and implications", *Journal of Occupational and Organizational Psychology*, Vol. 77 No. 4, pp. 439-461.
- Argote, L., Gruenfeld, D. and Naquin, C. (2001), "Group learning in organizations", in Turner, M.E. (Ed.), *Groups at Work: Theory and Research*, Erlbaum, Mahwah, NJ, pp. 369-411.
- Argyris, C. (1985), *Strategy, Change, and Defensive Routines*, Pitman, Boston, MA.
- Boak, G. (2014), "Team learning and service improvements in health care", *Team Performance Management: An International Journal*, Vol. 20 No. 5/6, pp. 242-261.
- Bunderson, J.S. and Sutcliffe, K.M. (2003), "Management team learning orientation and business unit performance", *The Journal of Applied Psychology*, Vol. 88 No. 3, pp. 552-560.
- Caniëls, M. and de Jong, J. (2018), "Guest editorial", *Team Performance Management*, Vol. 24 No. 7/8, pp. 350-362.

- Carmeli, A., Tishler, A. and Edmondson, A.C. (2012). "CEO relational leadership and strategic decision quality in top management teams: the role of team trust and learning from failure", *Strategic Organization*, Vol. 10 No. 1, pp. 31-54.
- Chan, C., Pearson, C. and Entekin, L. (2003), "Examining the effects of internal and external team learning on team performance", *Team Performance Management: An International Journal*, Vol. 9 No. 7/8, pp. 174-181.
- Crossan, M.M., Lane, H.W. and White, R.E. (1999), "An organizational learning framework: from intuition to institution", *Academy of Management Review*, Vol. 24 No. 3, pp. 522-537.
- Decuyper, S., Dochy, F. and Van den Bossche, P. (2010), "Grasping the dynamic complexity of team learning: an integrative systemic model for effective team learning", *Educational Research Review*, Vol. 5 No. 2, pp. 111-133.
- Denton, J. (1998), *Organisational Learning and Effectiveness*, Routledge, London, UK.
- Dimas, I., Rebelo, T., Lourenço, P. and Rocha, H. (2019), "A nonlinear dynamical system perspective on team learning: the role of team culture and social cohesion", in Misra, S., Gervasi, O., Murgante, B., Stankova, E., Korkhov, V., Torre, C., Rocha, A. M., Taniar, D., Apduhan, B. O. and Tarantino, E. (Eds.), *Computational Science and Its Applications – ICCSA 2019. Lecture Notes in Computer Science*, Vol. 11621, Springer International Publishing, Cham, Switzerland, pp. 38-49.
- Dyer, J.L. (1984). "Team research and team training: a state of the art review", in Muckler, F.A (Ed.), *Human Factors Review*, Human Factors Society, Santa Monica, CA, pp. 285-323.
- Edmondson, A. (1999), "Psychological safety and learning behavior in work teams", *Administrative Science Quarterly*, Vol. 44 No. 2, pp. 350-383.
- Edmondson, A. (2002), "The local and variegated nature of learning in organizations: a group-level perspective", *Organization Science*, Vol. 13 No. 2, pp. 128-146.
- Edmondson, A.C., Dillon, J.R. and Roloff, K.S. (2007), "Three perspectives on team learning: outcome improvement, task mastery and group process", in Brief, A.P. and Walsh J.P. (Eds), *The Academy of Management Annals*, Psychology Press, Hillsdale, NJ, pp. 269-314.
- Janis, I.L. (1972), *Victims of Groupthink*, Houghton Mifflin Company, Boston, MA.
- Koeslag-Kreunen, M., van den Bossche, P., Hoven, M., Van der Klink, M. and Gijssels, W. (2018), "When leadership powers team learning: a meta-analysis", *Small Group Research*, Vol. 49 No. 4, pp. 475-513.
- Kostopoulos, K.C. and Bozionelos, N. (2011), "Team exploratory and exploitative learning: psychological safety, task conflict, and team performance", *Group & Organization Management*, Vol. 36 No. 3, pp. 385-415.

- Langfred, C.W. (2004), "Too much a good thing? Negative effects of high trust and individual autonomy in self-managing teams", *Academy of Management Journal*, Vol. 47 No. 3, pp. 385-399.
- Lehmann-Willenbrock, N. (2017) "Team learning: new insights through a temporal lens", *Small Group Research*, Vol. 48 No. 2, pp. 123-130.
- Li, M. and Zhang, P. (2016), "Stimulating learning by empowering leadership", *Leadership & Organization Development Journal*, Vol. 37 No. 8, pp. 1168-1186.
- Lourenço, P.R. and Dimas, I.D. (2011), "From the past to the present: building workgroups", in Valentim, J.P. (Ed.), *Societal Approaches in Social Psychology*, Peter Lang, Bern, Switzerland, pp. 195-216.
- Marquardt, M. (1996), *Building the Learning Organization*, McGraw-Hill, New York, NY.
- Marsick, V.J. and Watkins, K.E. (1999), "Looking again at the learning organization: a tool that can turn into a weapon!", *The Learning Organization*, Vol. 6 No. 5, pp. 207-211.
- Marsick, V.J. and Watkins, K.E. (2003), "Demonstrating the value of an organization's learning culture: the dimensions of learning organization questionnaire", *Advances in Developing Human Resources*, Vol. 5 No. 2, pp. 132-151.
- Mathieu, J.E., Hollenbeck, J.R., Van Knippenberg, D. and Ilgen, D.R. (2017), "A century of work teams in the Journal of Applied Psychology", *Journal of Applied Psychology*, Vol. 102 No. 3, pp. 452-467.
- Mathieu, J.E., Tannenbaum, S.I., Donsbach, J.S. and Alliger, G.M. (2014), "A review and integration of team composition models: moving toward a dynamic and temporal framework", *Journal of Management*, Vol. 40 No. 1, pp. 130-160.
- McGrath, J.E., Arrow, H. and Berdahl, J.L. (2000) "The study of groups: past, present, and future", *Personality and Social Psychology Review*, Vol. 4 No. 1, pp. 95-105.
- Molenaar, I. and Chiu, M. (2017) "Effects of sequences of cognitions on group performance over time", *Small Group Research*, Vol. 48 No. 2, pp. 131-164.
- Morland, K., Breslin, D. and Stevenson, F. (2019), "Development of a multi-level learning framework", *The Learning Organization*, Vol. 26 No. 1, pp. 78-96.
- Navarro, J., Roe, R.A. and Artiles, M.I. (2015), "Taking time seriously: changing practices and perspectives in work/organizational psychology" *Journal of Work and Organizational Psychology*, Vol. 31 No. 3, pp. 135-145.
- Ortega, A., Sánchez-Manzanares, M., Gil, F. and Rico, R. (2010), "Team learning and effectiveness in virtual project teams: the role of beliefs about interpersonal context", *The Spanish Journal of Psychology*, Vol. 13 No. 1, pp. 267-276.

- Örtenblad, A. (2001), "On differences between organizational learning and learning organization", *The Learning Organization*, Vol. 8 No. 3, pp. 125-133.
- Rebelo, T.R., Stamovlasis D., Lourenço, P.R., Dimas, I.D. and Pinheiro, M. (2016), "A cusp catastrophe model for team learning, team potency, and team culture", *Nonlinear Dynamics, Psychology, and Life Sciences*, Vol. 20 No. 4, pp. 537-563.
- Rebelo, T., Dimas, I.D., Lourenço, P.R. and Palácio, A. (2018), "Generating team PsyCap through transformational leadership: a route to team learning and performance", *Team Performance Management: An International Journal*, Vol. 24 No. 7/8, pp. 363-379.
- Savelsbergh, C., van der Heijden, B. and Poell, R. (2009), "The development and empirical validation of a multidimensional measurement instrument for team learning behaviors", *Small Group Research*, Vol. 40 No. 5, pp. 578-607.
- Schein, E.H. (1999), "Empowerment, coercive persuasion and organizational learning: do they connect?", *The Learning Organization*, Vol. 6 No. 4, pp. 163-172.
- Senge, P.M. (1990), *The Fifth Discipline: The Art and Practice of the Learning Organization*, Doubleday, New York, NY.
- Senge, P., Kleiner, A., Roberts, C., Ross, R. and Smith, B. (1994), *The Fifth Discipline Fieldbook: Strategies and Tools for Building a Learning Organization*, Nicholas Brealey Publishing, London, UK.
- Sessa, V.I., London, M., Pingor, C., Gullu, B. and Patel, J. (2011), "Adaptive, generative, and transformative learning in project teams", *Team Performance Management: An International Journal*, Vol. 17 No. 3/4, pp. 146-167.
- Tanyaovalaksana, S. and Li, X. (2013), "Is there a relationship between individual learning, team learning, and organizational learning?", *Alberta Journal of Educational Research*, Vol. 59 No. 1, pp. 1-16.
- van den Bossche, P., Gijsselaers, W.H., Segers, M. and Kirschner, P.A. (2006), "Social and cognitive factors driving teamwork in collaborative learning environments", *Small Group Research*, Vol. 37 No. 5, pp. 490-521.
- van der Haar, S., Koeslag-Kreunen, M., Euwe, E. and Segers, M. (2017), "Team leader structuring for team effectiveness and team learning in command-and-control teams", *Small Group Research*, Vol. 48 No. 2, pp. 215-248.
- van der Vegt, G.S. and Bunderson, J.S. (2005), "Learning and performance in multidisciplinary teams: the importance of collective team identification", *Academy of Management Journal*, Vol. 48 No. 3, pp. 532-547.
- Wang, L, Han, J., Fisher, C.M. and Pan, P. (2017), "Learning to share: exploring temporality in shared leadership and team learning", *Small Group Research*, Vol. 48 No. 2, pp. 165-189.

- Wiese, C.W. and Burke, C.S. (2019), "Understanding team learning dynamics over time", *Frontiers in Psychology*, Vol. 10, article 1417.
- Wong, A. and Tjosvold, D. (2010), "Leadership values and learning in China: the mediating role of psychological safety", *Asia Pacific Journal of Human Resources*, Vol. 48 No. 1, pp. 86-107.
- Wong, S-S. (2004), "Distal and local group learning: performance trade-offs and tensions", *Organization Science*, Vol. 15 No. 6, pp. 645-656.
- Yeo, R. (2002), "Learning within organisations: linking the theoretical and empirical perspectives", *Journal of Workplace Learning*, Vol. 14 No. 3, pp. 109-122.
- Zellmer-Bruhn, M. and Gibson, C. (2006), "Multinational organization context: implications for team learning and performance", *Academy of Management Journal*, Vol. 49 No. 3, pp. 501-518.
- Zoethout, H., Wesselink, R., Runhaar, P. and Mulder, M. (2017), "Using transactivity to understand emergence of team learning", *Small Group Research*, Vol. 48 No. 2, pp. 190-214.

ⁱ In this paper, organizational learning and learning organization are not used in an interchangeable way. Following several authors (e.g., Denton, 1998; Örténblad, 2001), organizational learning is about the learning processes that occur in organizations, whereas the learning organization concept applies to organizations that intentionally develop strategies and structures with the aim of promoting learning processes. With the same perspective, we also distinguish team learning (the process) and learning team (a unit that intentionally develop strategies to learn).

ⁱⁱ Following other authors (e.g., Allen and Hecht, 2004; Mathieu *et al.*, 2017), the terms group and team will be used interchangeably throughout this paper.