

Shared mental models and shared temporal cognitions

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VALORIZATION

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The European Commission has recognized “the development of competences, creative and autonomous workers and teamwork” as important assets for both social and economic performance of organizations (Bütikofer, 2013). Recently, in a report that focuses on the creation of a competitive European Union labor market for the 21st century, the European Commission suggests that “investing in education and in developing skills that respond to the demands of the labor market and society is essential for growth and competitiveness ... [and], that entrepreneurship requires the development of transversal skills such as creativity, critical thinking, teamwork and a sense of initiative which contribute to young people’s personal and professional development” (Dlabajová, 2015).

Sustainability and competitiveness depend not only on macroeconomic policies; they also depend on organizational policies and on the dynamics established between individuals, teams, leaders, clients and suppliers that influence organizational performance. Thus, in order to promote the sustainable development of companies and organizations, it is crucial to also understand these micro foundations of organizational competitiveness. This thesis aims to contribute to organizational development by focusing on the team level – as organizations increasingly rely on teams to accomplish complex, demanding, and changing tasks.

Teams have a high capacity to process, store, and use information which makes them particularly suitable to solve problems and make multiple decisions efficiently and in a short period of time. The research reported in this thesis shows that teams achieve their goals efficiently when team members have shared mental models and shared temporal cognitions – a common understanding about the important task, team, and temporal aspects of work. This means that team members know *what* needs to be done, *who* does what, and *when* they need to do something. Shared mental models and shared temporal cognitions not only enhance team effectiveness, but they also facilitate important team processes. Shared mental models and shared temporal cognitions, as a cognitive component of teamwork, influence an affective component of team performance by reducing intragroup conflict, and a behavioral component by facilitating team learning behaviors, thereby enabling team members to improve their decision making performance. The findings of this thesis contribute to our understanding of the biggest threat in organizational teams – “the lack of clarity in roles and responsibilities – who does what, when, why and with whom” (Salas, personal communication, August 18, 2013).

Teamwork comes with a number of challenges both for team members and leaders. Team leaders need to motivate and coach their team members to collectively engage in goal directed behaviors. Team members have to be able to motivate themselves to work towards team goals, to and engage in productive relations with their teammates (i.e., without engage in conflicts), and to communicate and coordinate their work effectively. Hence it is pivotal to invest in teamwork skills to ensure that people are able to effectively work together and achieve the desired goals. The results of this thesis suggest that people need to be provided with teamwork skills at an early stage in their academic and/or professional live and throughout their professional career. Importantly, schools, universities, and organizations need to teach their students and employees teamwork skills and competencies, and provide them with strategies that can help them to develop shared mental models and shared temporal cognitions. By showing why and how teams function well and achieve their goals, the results of this thesis translate into social and economic value and are of interest to people responsible for the curricula offered in schools and universities, and of team-based organizations.

Schools and universities should include a number of transversal skills in their curricula, such as teamwork, conflict management, leadership, as these are increasingly important in their social and professional live. In the majority of jobs in our contemporary society, people work in teams, or at least in work groups, and it therefore is important that they have a thorough understanding of the behaviors and communication that facilitate effective cooperation and coordination. As a good example of teaching transversal skills, at Instituto Universitário de Lisboa (ISCTE-IUL) and Maastricht University students have the opportunity to enroll in courses about teamwork, conflict management, communication, and multiculturalism. Teaching those skills from an early stage in people's lives contributes not only to their personal development and to responsible behavior in society, but also to their professional career. Training programs and/or courses in transversal skills should provide students with information about teamwork (including, for instance, team cognition, coordination, communication, learning, and conflict management) that they can learn as well as transfer and apply in their live and in their future work environment. These programs and courses should provide students the opportunity to practice the skills and competencies learned while being supervised by the instructors and teachers who can give feedback to students.

Teams are important in various contexts and team functioning has consequences not only for team members and team leaders, but also for organizations, costumers and patients,

and even for society. In project teams, when a team does not work well, makes many mistakes and fails to achieve its goals, the client's needs will not be satisfied. As a result, the team's organization may lose the client and may see its reputation decrease. Individual team members may be penalized for their bad performance. When emergency teams, such as firefighters and rescue teams, malfunction, this may lead to dramatic consequences, including material damage and casualties. In healthcare contexts, medical errors may lead to patients' deaths and permanent disabilities, which has consequences for the patients and their families, professionals' careers, reputation of hospitals and professionals. Medical errors also have high financial consequences for hospitals.

A well-functioning team is not only beneficial for social reasons – for the interpersonal relations among people who live in society, and among team members who work together – but also for economic reasons. Teams that work well make less or no mistakes, are more productive and efficient, which increases organizational success and decreases organizational costs. As the findings of the research reported in this thesis show, teams are effective when they have shared mental models and shared temporal cognitions leading them to avoid conflicts, be creative, and learn from each other. Thus, when team members work well together it is more likely that the team achieves its goals, which enables the organization to diminish its costs and increase profits, become more competitive and sustainable. Therefore, employees need to develop knowledge and skills related to effective teamwork not only during their academic life, but also throughout their working life, reinforcing them on a daily-basis while they are working. If employees start to work in a team without having developed the skills needed to do so effectively, the team is likely to fail. In fact, sometimes breakdowns in teams result not from failure in technical skills, but from failure in interpersonal, teamwork, and inter-team skills.

Based on the findings of this thesis, training programs may be developed for professionals, both team members and team leaders, regarding shared mental models, conflict management, team learning and time management. A training program about temporal leadership may be offered in particular to team leaders in order to instruct them regarding optimal ways to help team members prioritize their tasks, to understand when they need to start to work on a task and when they need to finish it by communicating the temporal aspects of work to team members and monitoring them over time. Importantly, team members and leaders should be trained as a team, and in the context in which the team operates; and the training needs to be tailored for the specific team and the individuals that compose that team.

Teams are different from each other as each team has its own needs and problems. In training programs tailored for a specific team it is possible to develop and promote the aspects that are not well accomplished by team members (i.e., the team weaknesses). These customized training programs allow instructors to help team and team members to deal with their specific problems because “the same pill does not cure everyone diseases”. Team leaders should participate in the training programs with all team members as they facilitate the transfer and usage of the knowledge and competencies learned and practiced in the work context. These programs should also give to employees the opportunity to practice the skills and competencies being supervised by the instructors.

The findings of this thesis suggest that a shared understanding about the important aspects of work among team members established at the beginning of the team lifecycle facilitates a fruitful team functioning. Thus, in order to improve team effectiveness and in turn contribute to organizational competitiveness and sustainability, team members and team leaders should participate in planning sessions before the team starts to work. Importantly, these planning sessions used to define, for instance, goals, roles, and responsibilities, need to occur whenever a team starts to work in a new project, even for ongoing teams. Teams should not fall into the trap of starting to work in a new project without discussing and clarifying the main goals of the team, who is responsible for what, what are the main competences and preferences of each team member, how much time they have to work on the tasks, and when the deadlines are.

Planning sessions can be used to facilitate the development of shared mental models in teams. Teams, for instance, can be instructed to collectively create a mind map on paper or on a white board, by connecting the main actions team members need to do and the main information they need to get in order to accomplish the team task. The mind mapping should be visible to all the team members to enable them to adjust their own understanding to that of other team members and adapt their actions accordingly. Importantly, as the findings of this thesis show, shared mental models need to be accurate. Therefore, team leaders task experts or clients should be involved in the mind mapping discussion as much as possible to verify the extent to which the team’s mind map matches an external source. If this is not possible, team leaders and task experts could check and validate the mind map later and discuss their ideas and suggestions for improvement with the team afterwards. Planning sessions may be time-consuming at the beginning of the team lifecycle, but they help the team to focus on the task, reach team goals, and meet deadlines.

The findings of this thesis show that teams benefit from discussing their working methods, reflecting about what they have accomplished or not, and analyzing errors they might have made in order to avoid them in the future. Besides from team learning behaviors in which teams engage while they are working on the tasks, teams may benefit from participating in debriefing sessions after a team work experience or after the accomplishment of a sub-task. Debriefings are sessions in which team members reflect about a previous and recent experience, discuss the way they worked, identify what they learned, discuss opportunities to improve their work, and plan future tasks or work experiences. Debriefings may be conducted repeatedly over the team lifecycle, or at pre-scheduled moments. Debriefings can improve team effectiveness by providing team members with teamwork skills and competencies, which can improve team performance. In fact, debriefings have been shown to improve team performance by 20-25%, on average (Tannenbaum, Beard, & Cerasoli, 2013). Further, compared with team training, debriefings are less time-consuming because they last thirty minutes or less, and are less expensive to organizations because only team members and team leaders participate in the debriefing sessions. So, organizations do not need to spend money on hiring a trainer or instructor to manage the sessions. Debriefings can be used to help team members and team leaders to deal with interpersonal conflicts, to develop shared mental models, and to learn from each other. In sum, debriefings aim to provide teams with time to reflect, which can help them to increase their performance in subsequent performance episodes.

The training sessions, planning sessions, and debriefings that can benefit from the findings of this thesis are innovative because they are focused on a, sometimes, neglected level in organizations – the team level. Most of the time, managers, leaders and human resources professionals focus on the individual or organizational level. However, increasingly work is done in teams. What is more, the interventions based on the findings of this thesis are innovative because they are aimed at training team members as a collective in the context where they operate, rather than training people individually. By training a team together, team members have the opportunity to practice the competencies and skills *in loco* with each other.

Teamwork and team effectiveness is a complex and challenging topic in organizational behavior. The findings of this thesis show that a shared understanding about the central aspects of the team's work is important not only for team effectiveness, but also for team processes by reducing intragroup conflict and facilitating team learning. Importantly, this research can lead to the production of useful, effective, and implementable training

programs and interventions that can help teams to be effective, and organizations to be competitive and sustainable, which has social and economic value. Therefore, team leaders and managers need to develop research-based practices for improving teamwork in organizations.

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