Team Learning: New Insights Through a Temporal Lens

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Abstract

Team learning is a complex social phenomenon that develops and changes over time. Hence, to promote understanding of the fine-grained dynamics of team learning, research should account for the temporal patterns of team learning behavior. Taking important steps in this direction, this special issue offers novel insights into the dynamics of team learning by advocating a temporal perspective. Based on a symposium presented at the 2016 Interdisciplinary Network for Group Research (INGRoup) Conference in Helsinki, the four empirical articles in this special issue showcase four different and innovative approaches to implementing a temporal perspective in team learning research. Specifically, the contributions highlight team learning dynamics in student teams, self-managing teams, teacher teams, and command and control teams. The articles cover a broad range of methods and designs, including both qualitative and quantitative methodologies, and longitudinal as well as micro-temporal approaches. The contributors represent four countries and five different disciplines in group research.

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To stay competitive and cope with ever-increasing complexity in the global economy, organizations rely on teams to adapt and learn continuously (e.g., Shuffler, DiazGranados, & Salas, 2011). Team learning is a process that yields "a relatively permanent change in the team's collective level of knowledge and skill produced by the shared experience of the team members" (Ellis et al., 2003, p. 822). Unlike individual learning, team learning often involves members learning from their fellow team members' experiences (as well as their own), via sociocognitive and interpersonal interaction processes that coordinate and integrate individual cognitions (e.g., van den Bossche, Gijselaers, Segers, & Kirschner, 2006).

Team learning involves many behaviors that include exploring ideas and processes, discussing differences, and resolving them to co-construct new understanding. Team members share, discuss, and reflect on important issues, processes, and outcomes (e.g., Erhardt, Gibbs, Martin-Rios, & Sherblom, 2016; van der Haar, Segers, Jehn, & van den Bossche, 2015). Furthermore, team members ask questions, explore different perspectives, challenge assumptions, identify flaws, and examine unexpected outcomes (e.g., Savelsbergh, van der Heijden, & Poel, 2009) within a process of constructive conflict (Erhardt et al., 2016; van der Haar et al., 2015). By making sense of these differences and ideally integrating them together into a coherent account, team members co-construct meaning and mutual agreement (e.g., Decuyper, Dochy, & van den Bossche, 2010; Edmondson, Dillon, & Roloff, 2007; Erhardt et al., 2016). These behaviors emerge and evolve as team members interact over time within a social, temporal context (van der Haar, Segers, & Jehn, 2013; see also Kostopoulos, Spanos, & Prastacos, 2012; Santos, Uitdewilligen, & Passos, 2015). As such, team learning is essentially a temporal phenomenon.

However, true temporal dynamics in teams continue to be understudied, despite repeated calls to move beyond studying groups at static points (e.g., Herndon & Lewis, 2015; Leenders, Contractor, & DeChurch, 2016; Roe, Gockel, & Meyer, 2012). The lack of empirical work that has the potential to untangle the fine-grained temporal dynamics of team behavior concerns both the team learning literature specifically and team process research more broadly. Hence, advancing our understanding of team learning requires more research that pursues a temporal perspective and invests efforts to pinpoint the micro-level behavioral dynamics underlying team learning processes.

Temporal analyses of team learning processes can cover a range of levels of analysis or granularity, depending on specific research questions, the access to and quality of longitudinal and behavioral data, and methodological tools. First, at the macro-time level, a team comes into being, engages in activities, gains and loses members, and may come to a formal end (e.g.,

Gersick, 1988; Tuckman & Jensen, 1977). In this broader temporal view, longitudinal team studies can measure team learning behavior across several points in time and examine how team learning processes develop over days or months (e.g., Paletz, Kim, Schunn, Tollinger, & Vera, 2013; Yoon & Johnson, 2008). Insights from such analyses can advance our understanding of team learning activities and outcomes across larger periods of time, or even across a team's life span.

Second, at narrower, meso-time spans, researchers can consider how team learning unfolds within different phases of a team's interactions. For example, a team conversation can be divided into phases of interaction or clusters of behaviors (e.g., Goh, Fisher, & Sommer, 2015; Lehmann-Willenbrock, Beck, & Kauffeld, 2016; Poole & Dobosh, 2010). Team learning might be more likely to occur in particular interaction phases (especially if facilitated during these phases), for example, after watershed moments in a team's interaction flow (cf. breakpoint analysis; e.g., Wise & Chiu, 2011). Moreover, at a more granular meso-temporal level, researchers have considered how temporal patterns of behavior emerge during team interactions and shape performance outcomes (e.g., Lehmann-Willenbrock & Allen, 2014; Lei, Waller, Hagen, & Kaplan, 2015; Stachowski, Kaplan, & Waller, 2009). In the context of team learning, such analyses could advance our understanding of the behavioral patterns that characterize successful team learning processes.

Finally, at the micro-temporal level, the main medium by which teams collaborate, learn, and achieve performance outcomes concerns the moment-to-moment behavioral dynamics of their conversations (e.g., Bonito & Sanders, 2011; Keyton & Beck, 2009; Lehmann-Willenbrock, Chiu, Lei, & Kauffeld, 2017). Group scholars have discussed such micro-level team processes at the core of group functioning for decades (e.g., Bales, 1950; Hackman & Morris, 1975; McGrath, 1984). More recently, these micro-temporal team processes have been subsumed under the fashionable *big data* umbrella, considering the vast amounts of behavioral data that tend to accumulate at the micro-level behavioral event level (Kozlowski, Chao, Chang, & Fernandez, 2015). For instance, a recent study of team processes and leadership dynamics during 30 regular team meetings entailed a fine-grained quantitative analysis of 30,128 verbal behaviors (Lehmann-Willenbrock, Meinecke, Rowold, & Kauffeld, 2015). Given novel statistical developments, researchers can now test how micro-level team (learning) behaviors and their sequences are impacted by previous behaviors, individual characteristics, team attributes, temporal phases, and organizational settings simultaneously (e.g., Chiu & Lehmann-Willenbrock, 2016).

In sum, team learning processes are inherently temporal phenomena and can be explored using a wealth of different temporal scopes and research

methods. This special issue of *Small Group Research* brings together four studies that adopt a temporal lens to advance our understanding of team learning processes. These four studies illuminate the temporal dynamics of team learning across a range of team tasks and team types, including student teams, self-managing teams, teacher teams, and command and control teams. Moreover, the influence of leadership on team learning takes different shapes across these different settings, ranging from leaderless groups to self-managing teams to formalized leadership structures. These articles examine temporal team learning processes at different levels of granularity, ranging from changes in team learning across different temporal phases to micro-level conversational dynamics. Moreover, this special issue covers a broad range of measures and analytical methods to analyze temporal team learning processes: longitudinal survey measures, fine-grained interaction coding, qualitative conversation analysis, lag sequential analysis, and statistical discourse analysis.

Overview of the Empirical Contributions

The article by Inge Molenaar and Ming Ming Chiu examines sequences of cognitive and metacognitive activities by 18 student triads who discussed writing a report about living in a foreign country. At the micro-level, Molenaar and Chiu analyzed 32,375 turns of talk, using both content analysis and statistical discourse analysis (SDA, Chiu, 2008; Chiu & Lehmann-Willenbrock, 2016). Their findings advance our understanding of team learning by showing how specific sequences among students' cognitive activities are linked to their group performance at multiple time periods, which the authors embed within a micro-temporal theory of collaborative learning.

In the article authored by Lan Wang, Jian Han, Colin M. Fisher, and Polly Pan, these scholars examine team learning across larger units of time, using a longitudinal approach with three measurement points. Specifically, Wang and colleagues investigate the link between shared leadership and team learning behaviors in a sample of 79 executive MBA student teams who participated in a 4-day business strategy simulation. Their results show that the relationship between shared leadership and team learning changes over time. That is, shared leadership promotes learning behavior during the early stages of team collaboration but has a curvilinear effect on learning behaviors in later phases. These findings show that this link between leadership and team learning is more complex than previously believed and emphasize why a temporal perspective is needed to understand it.

The third article by Hildert Zoethout, Renate Wesselink, Piety Runhaar, and Martin Mulder presents an in-depth video case study of teacher teams

engaged in team learning. The authors propose transactivity (the extent to which learners build on each other's reasoning) as an analytical framework to understand how team learning processes emerge. They use fine-grained conversation coding on video data of three teacher teams to select interactional sequences and examine when and how team learning processes (sharing, co-construction, and constructive conflict) take place in these interactional sequences. Their findings emphasize that processes such as sharing, co-construction, and constructive conflict change when team members act more closely on each other's reasoning, and that temporal and situated measures of team learning are necessary in order to measure these changes.

The fourth article by Selma van der Haar, Mieke Koeslag-Kreunen, Eline Euwe, and Mien Segers also relies on video data to pinpoint the social dynamics of team learning. Their exploratory study focuses on the key idea that team leaders can support team learning (especially constructive conflict) and team effectiveness with structuring behaviors over time, particularly when teams are working under pressure. They test this idea in a sample of 17 emergency management command and control teams, videotaping two meetings per team at two points in time. Their quantitative interaction analysis shows that leaders of effective teams and teams using the team learning process of constructive conflict use more structuring behaviors in earlier time periods but fewer of these behaviors in later time periods, compared with leaders of less effective teams. Again, these findings emphasize the need to include a temporal perspective for understanding team learning dynamics.

Taking important steps toward addressing this need, this special issue offers new insights into the complex phenomenon of team learning by advocating a temporal perspective. The four articles showcase different approaches to implementing a temporal perspective in team learning research, ranging from qualitative to quantitative methodologies and from longitudinal to micro-temporal approaches. All four contributions were presented and discussed during a symposium at the Annual INGRoup conference in Helsinki 2016. The authors are from four different countries and represent five different disciplines in the study of groups and group processes. As such, this special issue aligns with the mission of *Small Group Research* to promote novel insights into group and team dynamics from an interdisciplinary stance. I hope that the four contributions will inspire future research to pursue a temporal perspective of team learning across different disciplines.

Declaration of Conflicting Interests

Funding

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