Review

Change in team learning behaviours in work teams – A systematic review

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ABSTRACT

This systematic review aims at a better understanding of change in team learning behaviours in work teams by integrating findings regarding team learning over time. Based on technical (e.g., longitudinal studies) and content-related (e.g., focus on work teams) selection criteria 15 longitudinal studies that examine change in team learning behaviours in work teams were found. A narrative synthesis of relevant findings was conducted. This review provides definitions of the various types of change in team learning behaviours (dynamics, pattern, development and minor change) that are identified by analysing and integrating the results of the found studies, whereby different kinds of change in learning behaviours in work teams are identified. Based on the findings, implications are drawn for practice to sustainably foster work teams, for instance by ensuring stable team learning conditions for work teams to counteract decreases in the engagement in team learning behaviours. Furthermore, needs for future research are derived, such as the need for mixed methods studies with more than three measurement points in short intervals.

1. Introduction

Due to societal, economic and technological developments organisations face challenges and must develop adaptive strategies over time to be sustainable. For example, the need for implementing digital solutions and modifications in organisational structures due to increases in advanced technology and globalisation (Boneva, 2018). To face such challenges, complex and knowledge-intensive work tasks have to be accomplished. Work teams were introduced because they can accomplish those tasks more efficiently, effectively and innovatively than individuals by team members' engagement in team learning behaviours (e.g., Decuyper et al., 2010; Van Woerkom & Croon, 2009). In this present study, work teams are defined as teams that are embedded in the organisational context to accomplish for the organisation relevant work tasks, the team members are interdependent regarding task accomplishment, share common goals and interact socially (Kozlowski & Bell, 2003). For long-term success of such teams, organisations have to foster them. As work teams change over time, understanding is needed on how they change. Therefore, examining team change is essential. In this present study, change is defined as an observed difference over time in selected dimensions within work teams, such as learning conditions, team composition or learning behaviours (cf. Van de Ven & Poole, 2005). As team learning behaviours are the core of team development and consequently crucial for increasing performance of these teams, this review focuses on behavioural change in team learning behaviours (cf. Decuyper et al., 2010). For reasons of readability, the term behavioural change is used throughout this manuscript and refers to change in team learning behaviours. Regarding change there are several theories that focus on organizational (e.g. Bartunek, 2014;

Nelson & Winter 1982) or individual change (e.g. George & Jones, 2001). These theories indicate that there are various types of change. However, which change regarding team learning appear is in theories as well as in empirical studies largely neglected and therefore more studies are needed for a comprehensive understanding (see Edmondson & Harvey, 2025). There are calls for deeper insights into the dynamic nature of teams in particular of team learning behaviours that would be needed to explain contradictions across prior studies (see Edmondson & Harvey, 2025; Harvey et al., 2023). Recent reviews try to grasp team change by focusing on various dimensions of teams, such as team composition (e.g., Delice et al., 2019), but do not focus on team learning behaviours. Reviews that do focus on team learning (e.g., Wiese & Burke) do not provide answers on how team learning behaviours, and more specifically their characteristics, change over time. If at all, they deal with time related characteristics such as temporal diversity, individual change or relationships over time or try to grasp change in a linear way by investigating various team phases (e.g. Wiese & Burke, 2019). Thereby, they focus more on 'what is' instead of 'what happens', although an understanding about 'what happens' is crucial in order to grasp change in detail (Roe, 2008). Change in team learning behaviours are chaotic processes with observable increases and decreases of various characteristics of team learning behaviours (cf. Roe, 2012). Furthermore, there is no common understanding on what change is, and there is inconsistency in terminology. Different terms such as 'variability', 'trajectories', 'cyclical fluctuation', 'dynamics,' 'changes', 'patterns,' or 'development,' are used to describe the same issues (cf. Delice et al., 2019; Roe et al., 2012; Wiese & Burke, 2019). Therefore, the aims of this review are to determine what change regarding team learning behaviours can be, how team learning behaviours change over time and which types of change occur in natural work teams. In so doing, the review increases the awareness of the different types of change, by increasing insights into the different terms used for behavioural change, into the similarities and differences in the meaning of those terms, and into what exactly can change. Thereby, knowledge on the meaning of change in relation to team learning expands, which is needed to provide more clarity in how behavioural change in work teams can be described, identified and in the end fostered. This systematic review addresses the aforementioned shortcomings by answering the following research questions:

1) How do team learning behaviours in work teams change over time?
2) Which types of behavioural change occur in natural work teams?

2. Theoretical framework

2.1. Conceptualization of team learning over time

Team learning is defined as a process that consists of various team learning behaviours that change over time, is influenced by multiple conditions, and leads to one or more outcomes (Argote et al., 2001; Arrow & Cook, 2008; Decuyper et al., 2010). There are various approaches in conceptualising team learning over time. For example, various theoretical models on team development advocate a linear approach to time, and divide the development into multiple phases demarcated by change in learning conditions and levels of engagement (e.g., Gersick, 1988; Tuckman, 1965; Wheelan, 2005). Although the various models differ and some of them emphasise that there is change within the phases (e.g., Gersick, 1988) the assumption is that teams go through these phases sequentially and cannot reach the next phase before having passed the previous one. Thus, these models can be beneficial to identify patterns in how a team can develop over its lifecycle. However, as team learning behaviours can also change over short time intervals, and in a non-linear sequence, such team development models do not seem to be appropriate to understand change in work teams to its full extent. Moreover, this conceptualization cannot be universally applied to all types of teams as such models are based on qualitative research, or on experimental design studies that do not consider the context of the team, which determines the team learning conditions (cf. Kozlowski & Bell, 2003). Instead of team development models, input-process-output (IPO) models can also be used for investigating change over short time intervals in order to understand change within various phases of team development. Although early IPO models neglected the influence of time, more recent circular IPO models take into account time aspects by taking a less linear approach to understanding team learning (e.g., Decuyper et al., 2010; Sessa & London, 2008). Team learning conditions, behaviours, and outcomes are considered from a temporal perspective, conceptualising team learning as a circular process (e.g., Decuyper et al., 2010; Gibson & Vermeulen, 2003). Team learning outcomes serve as team learning conditions, influencing learning behaviours, leading to various outcomes, and so on (e.g., Kozlowski & Bell, 2008; Sessa & London, 2008). These three components can change and predict one another over time. By examining change, it is crucial to zoom on the different specific behaviours to understand how a team changes instead of comparing different teams with each other (Roe, 2012).

2.2. Team learning behaviours

Team learning behaviours can lead to a wide variety of performance aspects and other behavioural, cognitive or affective outcomes that have to be taken into account in order to grasp team learning to its full extent (Decuyper et al., 2010). Examples of outcomes of team learning are aspects of team performance, such as the quality, innovativeness, effectiveness, and efficiency (e.g., Van Woerkom & Croon, 2009), health (e.g., Razinskas & Hoegl, 2020), innovative behaviour (e.g., Widmann & Mulder, 2018) or shared mental models (e.g., Mohammed et al., 2010). Team learning behaviours are characterised by forms of social interaction between team members while accomplishing work tasks. For instance, giving feedback, sharing, storing and retrieving knowledge, jointly reflecting on work strategies, and communicating with individuals outside the team (e.g., Raes et al., 2015; Van den Bossche et al., 2006). Different types of team learning behaviours are described, by using various terms. These were reviewed and analysed by Decuyper et al. (2010), who identified seven primary team learning behaviours: *Knowledge sharing* refers to knowledge, competences, opinions, or thoughts of the

team members that are shared through communication or exchange of materials. *Constructive conflict* represents interactions involving debate or differences of opinion allowing team members to explore conflicting perspectives, to clarify miscommunication, and to expand their perceptions. *Co-construction* implies interactions that lead to the development of shared knowledge and new interpretations by refining, enhancing, or modifying an original idea. This enables the team to uncover previously unrealised meanings. *Boundary crossing* refers to interactions with individuals outside of the team to gather new information, knowledge, and experience. These interactions may include communicating with external experts. *Team activity* describes all collaborative work activities of team members to achieve shared objectives. Decuyper et al. (2010) called this process 'learning by doing.' Team activity includes all behaviours leading to goal attainment. *Team reflexivity* represents interactions that clarify team status quo, goals, methods, and work tasks by restructuring strategies, methods, tasks and processes. *Storage and retrieval* refer to activities that serve to document information, develop routine procedures, clarify plans, and share ideas in such a way that they can be used for future work tasks or subsequent examination (Decuyper et al., 2010; Van der Haar et al. 2013). These team learning behaviours emerge bottom-up over time through repeated team members' interactions and can change over time (Decuyper et al., 2010; Kozlowski & Bell, 2003, 2008), which is described in the following section.

2.3. Behavioural change

Regarding team learning behaviours over time it is crucial to consider (1) what characteristics of team learning behaviours can change, and (2) how these characteristics can change.

Characteristics include a) *frequency*: how often, over a specific period, do team members engage in one particular team learning behaviour; b) *duration*: how long do team members engage in a specific team learning behaviour; c) *intensity:* with which intensity are team learning behaviours carried out by team members; and d) *quality*: what the content of team learning behaviours is, and how that relates to criteria that define what quality is (Roe, 2008; Roe et al., 2012). Although team learning behaviours can be observed separately, which means focusing on a single aspect of team learning behaviour, multiple team learning behaviours can occur in combinations. Furthermore, team learning behaviours can change regarding their sequence in which they appear, as they can appear consecutively over time (cf. Decuyper et al., 2010). This review focuses on single team learning behaviours, separately. This means that the focus is on how single specific team learning behaviours change over time. By examining team learning behaviours separately, change in various team learning behaviours can be analysed in more detail to provide implications for organisations to foster work teams purposefully to reach high team performance (Widmann & Mulder, 2018). In accordance with the definition of change, as aforementioned, work teams' behavioural change is defined as an observable difference regarding frequency, duration, intensity and/or quality of team learning behaviours. For studying such differences, a variance method is needed. There are two approaches of variance methods for studying change (Van de Ven & Poole, 2005). While the first approach assumes that time is a linear continuum that can be divided into uniform units, all of which are equivalent, and that time is independent of the objects and people who experience it. This approach is useful for investigating causes of change and relationships between variables. The second variance method conceptualizes change as a succession of events, phases, cycles, or states in the development or growth and focuses on how change unfold in entities. This is a process-oriented approach that is needed to identify event series or the structure of an unfolding process (Van de Ven & Poole, 2005). As team learning is a process and team learning behaviours are observable series of events (Roe,
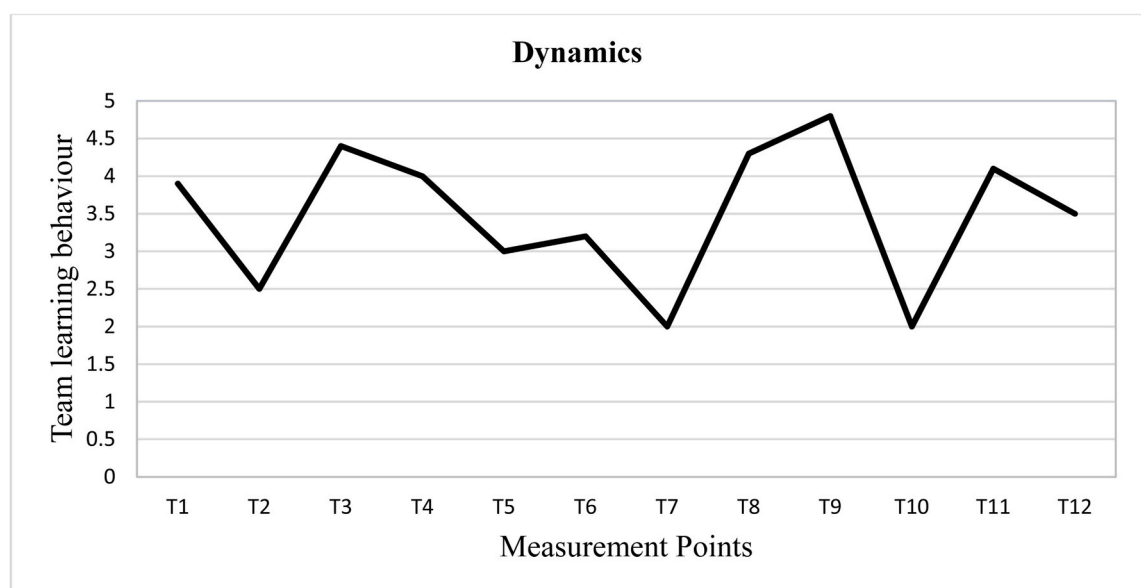

Fig. 1. Visualisation of behavioural dynamics (fictive data).

2008) for deep understanding of team learning behaviours changes over time, the second approach is needed. Observable events are time-bound and can emerge, disappear, and reappear at any given point. Events can be described as team learning episodes that have a beginning and an end (Roe, 2008; Wiese & Burke, 2019). They can last a short while whereas other episodes may never be completed (Wiese & Burke, 2019). What happens during a team learning episode can also be short-lived, long-lasting, or intermediate, ranging from seconds to years. Consequently, behavioural change focuses on what happens during these time intervals. Team learning over time can be analysed at different levels of durations of the team learning episodes and enables various insights into the behavioural change (Lehmann-Willenbrock, 2017): a) The *macro-time level* refers to a broad temporal view over a considerable period. It is here that the change of team learning behaviours observed over days or months are described. b) The *meso-time span* zooms on the team learning behaviours and considers different phases of these behaviours as described in relation to the macro-time level. c) The *micro-time level* is a narrow temporal view over a short period. At this level, moment-to-moment behavioural change undergoes fine-grained analysis.

Based on the analysis of previous research, below four types of change are discussed: dynamics, pattern, development and minor change. Change for all types can consist of increase or decrease and of changes in sequence, in frequency, intensity, duration and/or quality. Fluctuation in all types can occur over a brief interval or an extensive interval at the macro-time, meso-time, or micro-time span. Precise definitions and clear distinctions are largely lacking in research, so far (cf. Delice et al., 2019; Roe et al., 2012; Wiese & Burke, 2019). Therefore, the following sections concern the discussion of the four types, with aligning visualisations in Figs. 1–4.

2.3.1. Dynamics

Researchers have described dynamics in multiple ways. For instance, Wiese & Burke (2019) argue that teams are dynamic as they develop, change, and evolve. Delice et al. (2019) state that dynamics are non-static and non-linear. A definition on characteristics of dynamics and the components of team learning that can change is missing. Kozlowski (2015) describes two ways of how dynamics can be conceptualised: first, as a process by which team learning behaviours emerge over time; second, as phenomena that vary within teams and exhibit growth trajectories that can increase, decrease, or fluctuate cyclically. Following Kozlowski (2015), in this present study dynamics is defined as a sequence of increases and/or decreases in frequency, duration, intensity, or quality of team learning behaviours in a chaotic way without any regularity.

2.3.2. Patterns

Roe (2008) describes behavioural patterns as behaviours that are carried out until completion and start again after a time lapse. Patterns can be stable and non-stable. Only marginal, if any, fluctuations in behavioural characteristics occur if the sequence is stable, with only unstable sequences displaying sizable increases or decreases.

Rosing et al. (2018) described two competing theoretical perspectives that attempt to conceptualise patterns of behaviours change in a temporal context. While the *linear perspective* assumes a sequence of distinct phases that build on each other, the *complexity perspective* takes on a sequence of chaotic fluctuations that may seem random but repeat over time. In this present study, patterns are defined as a sequence of increases and/or decreases in the frequency, duration, intensity, or quality of team learning behaviours that are repetitive.
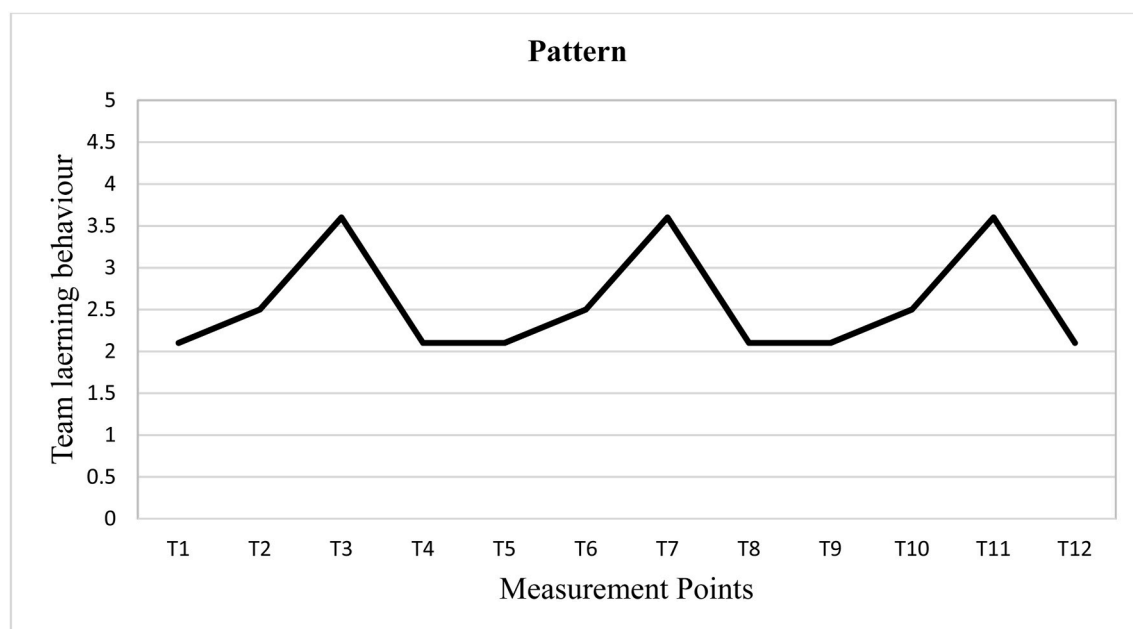

Fig. 2. Visualisation of behavioural pattern (fictive data).

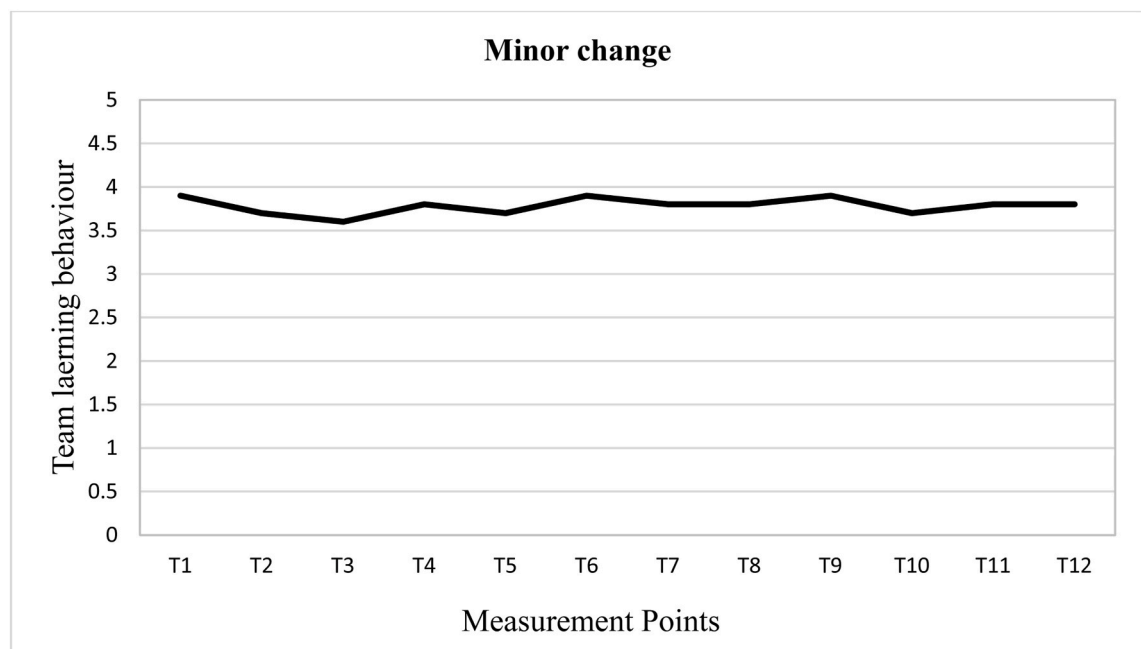**Fig. 3.** Visualisation of behavioural development (fictive data).

Fig. 4. Visualisation of minor behavioural change (fictive data).

2.3.3. Development

Linear and flexible views on behavioural development can be found in existing literature (e.g., Erbert et al., 2005; Gersick, 1988; Tuckman, 1965). Strictly linear perspectives do not fully reflect work team development in the real world, as team development can be accelerated at critical moments when teams feel an urgency to innovate, change their work, or make decisions (cf. Erbert et al., 2005; Gersick, 1988; Raes, 2015). Increases in frequency, duration, intensity or quality of team learning behaviours occur when work teams realise that existing work routines are inadequate to reach common goals and action is therefore needed (Erbert et al., 2005; Gersick, 1988; Raes, 2015). Based on these considerations, this study defines development as a sequence of major increases, possibly in combination with minor decreases, in frequency, duration, intensity, or quality of team learning behaviours. Characteristics of team

learning behaviours can stagnate or initially decrease, but overall, they increase.

2.3.4. Minor change

Following Kozlowski (2015), the extent of the engagement in team learning behaviours could be stable over time, implying that

Identification	Electronic database search: N=117886	
	Records after filtering for quality and language: N = 91492	excluded: N = 26394
	Records after duplicates removed: N = 59321	excluded: N = 32171

Screening	Records after screening titles and abstract N = 18749	excluded: N = 40572
	Records after full text sought for retrieval N = 18731	excluded: N = 18
	Records after screening study designs: N = 6127	excluded: N = 12604
	Records after screening regarding content-related criteria: N = 17	excluded: N = 6112

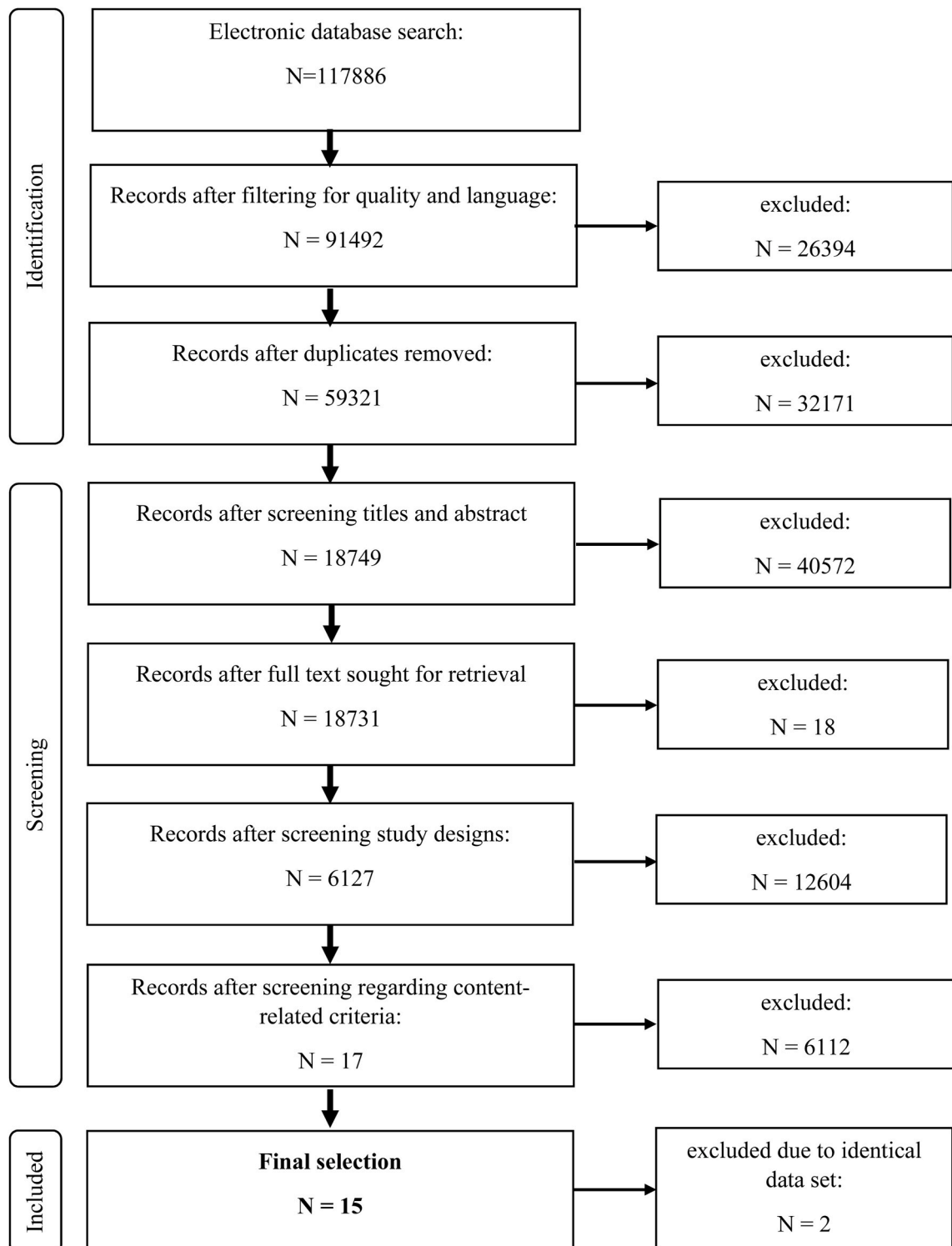| Included	**Final selection** **N = 15**	excluded due to identical data set: N = 2

Fig. 5. PRISMA flow chart (based on Page et al., 2021).

there is no change at all. Moreover, Roe et al. (2012) indicate that team learning behaviours can be stable over certain periods of time. Stability does not mean that the characteristics of team learning behaviours are exactly identical in their extent. Rather research shows that there is almost always some kind of change but it is not always clearly identifiable (cf. Decuyper et al., 2010; Roe, 2008). Therefore, to avoid misunderstanding, this category of stability is labelled in this study as minor change. In detail, minor change is defined as a sequence of minor increases and/or decreases in the frequency, duration, intensity or quality of team learning behaviours.

3. Method

3.1. Search strategy

In order to answer the research question, we carried out a systematic literature review, following the PRISMA guideline (cf. Page et al., 2021), to summarise the current state of research. Four different data sources, *Web of Science, Psyndex, PsycArticles* and *Business Source Premier* are used, because they cover different domains which makes it possible to also find interdisciplinary studies concerning team learning behaviours. The selected keywords were derived from the aforementioned considerations. The basic search terms 'team', 'work group' and 'work team' were used, and were combined with terms which describe team learning over time such as 'change', 'dynamics', 'pattern' and 'development', as for instance 'work team AND change'. Furthermore, other terms were used to describe behaviours such as 'learning', 'behav*', 'activities', 'processes' combined with the following time factors 'time', 'longitudinal', 'temporal', 'long-term', 'panel' and 'wave'. For instance, we used the combination 'work team AND learning AND time'. Altogether 125 different keyword combinations were used in the four datasets. In Web of Science there were 68401 hits, in Psyndex 4734, in APA PsycArticles 10783 and in BusinessSource Premier 33968 (total hits: 117886). In addition to this search strategy the snowballing technique was applied: if there was a study that matched the selection criteria, we looked into the literature index to search for related research. Using the selection criteria resulted in 15 studies that were included in the present study. Two studies were excluded because these studies used the same data as a previous included study (Bednall & Sanders, 2017 vs. Bednall et al., 2018; Widmann et al., 2019 vs. Watzek et al., 2022). For further information about the selection process see Fig. 5.

3.2. Selection criteria

3.2.1. Technical criteria

The technical selection criteria relate to 1) the quality of the studies. All studies had to be publications in peer reviewed journals. Monographs were not systematically excluded, but the search did not lead to any books that matched the selection criteria. 2) Only longitudinal studies are included because of the aim to identify change over time. Longitudinal studies with two or more measurement points are included. 3) The publication year of the studies was neglected to cover the whole state of research. 4) In accordance with the aim of this review the studies had to be field studies investigating work teams. Consequently, experimental studies were excluded, as the transferability of results of these studies to natural work teams is rather low (Kozlowski & Ilgen, 2006), due to that the characteristics of the work context are not taken into account (cf. Decuyper et al., 2010).

3.2.2. Content-related criteria

One selection criterion was that the study has to contain information about team learning behaviour that was measured at least two times in order to get insight into change. Secondly, as the focus of this review is on natural work teams that work on their real work tasks, all studies with samples of student teams as well as teams in simulations were excluded. Student teams and simulation teams differ from work teams for instance in goal intention, interdependence, and work conditions (Fischlmayr & Kepler, 2009; Mulder, 2022). Thirdly, as the aim of this study is to analyse behavioural change, those studies were selected where more than 50 percent of the items within the scales on team learning behaviours refer to actual behaviour, to assure that behaviour was measured. There are for example other studies that foremost included attitudes of the team members, which, would have hindered appropriate comparison of the various study results.

3.3. Synthesizing process

The results from the studies that met the selection criteria, were narratively synthesized. This approach consists, in accordance with Rodgers et al. (2009), of various stages. After developing a theoretical framework, the development of a preliminary synthesis followed that contains categorizations of the various variables. In this stage various variables found in the studies were categorised according to the theoretical dimensions of team learning outcomes, team learning behaviours and behavioural change. This provides answers to research question one. Concerning team learning behaviours, the seven behaviours *knowledge sharing, constructive conflict, co-construction, boundary crossing, team activity, team reflexivity* and *storage and retrieval* were used as categories. Four categories of behavioural change were distinguished: *pattern, dynamics, development* and *minor change*. The categorization was conducted inductively in relation to the definitions of the various team learning behaviours and types of change, as described in the theoretical framework. The next stage (Rodgers et al., 2009) includes the analysis of additional relevant results and exploring the relationships within studies and between the findings of different studies. This provides answers to research question two. Some selected studies also examine how team learning behaviours relate to team learning outcomes over time. As these relationships also provide insights into behavioural change in work teams by indicating how behavioural change can have an impact on future team learning outcomes, such relationships are presented in the next section. The team learning outcomes that are examined in the identified studies are inductively categorised in

team performance and innovative work behaviour. Finally, the results are critically proofed regarding robustness of the synthesis by checking the synthesis with the theoretical framework (see Rodgers et al., 2009).

4. Results

4.1. Overview of the studies

An overview of the study characteristics is depicted in Table 1. Empirical studies on team learning have increased over time. The studies are published between 2002 and 2022, whereby the majority of the studies (N = 7) are published in the last 5 years between 2017 and 2022 and are carried out in a wide range of domains. There are no studies found from before 2002 that meet the selection criteria. About a third of the studies were in the domain of education, followed by the production industry and health care. Furthermore, the majority of studies are carried out in Europe, followed by North America, and Asia. A variety of research designs was applied. More than half of the studies had a quantitative design, about a third a qualitative design and two studies had a mixed methods design. All quantitative studies used surveys for data collection. The qualitative studies used various instruments, such as interviews, observations, e-mails or other documents. The mixed methods studies contain surveys and observations.

4.2. Outcomes of team learning behaviours over time

Five studies examine besides behavioural change also temporal relationships between team learning behaviours and various outcomes (see Table 2). Table 2 includes the investigated variables, the samples, the methods, the measurement points, the analyses and the effects. The studies examined the following team learning behaviours: team reflection, sharing, boundary crossing, and team activity. The results cover the categories of team learning outcomes: team performance and innovative work behaviour. All studies examined the frequency of team learning behaviours. The relationships between the frequency of team learning behaviours and team learning outcomes over time are described first.

4.2.1. Team learning behaviours and team performance

The studies indicate positive relationships between team reflection and team performance for the three factors efficiency, effectiveness (Buljac & Van Woerkom, 2015) and quality (Bednall et al., 2014) but not for innovativeness (Buljac & Van Woerkom, 2015).

Between both knowledge sharing and team activity and team performance no significant relationship was found over time (Bednall et al., 2014; Knight, 2015).

4.2.2. Team learning behaviours and innovative work behaviour

Three team learning behaviours, namely team reflection, sharing and boundary crossing were examined in relation to innovative

Table 1
Characteristics of the included studies.

Study characteristics		Number of studies
Publication year	2022–2017	10
	2016–2011	2
	2010–2005	1
	2005–2002	2
Origin of the study	Europe	10
	North America	3
	Asia	1
	Multinational	1
Domains	Health Care	3
	Education	4
	Industry	3
	Finance and Insurance	1
	Real estate	1
	Military	1
	Research	1
	Mixed	1
Method	Quantitative	7
	Mixed-Methods	3
	Qualitative	5
Instrument	Survey	7
	Survey & Observation	1
	Interviews	1
	Observation	1
	Multiple Sources	5

Note. This table includes the characteristics of the identified studies; N = 15 studies.

Table 2
Temporal relationship between team learning behaviours and various outcomes.

Theoretical Categories		Study variables		Sample	Method	MSP (duration)	Analysis	Effects		Study
TLBs	Outcome	TLBs	Outcome					r- values	β-values	
Construc-tive Conflict	TP	Constructive conflict	Quality of actions	17	IIIa	3 (hours)		1-3: .51* 2-3:.65**	–	Van der Haar et al. (2017)
		Constructive conflict	Goal achievement					1-3: .27 2-3:.27	–	
Team reflection	TP	Team reflection	Efficiency	246	Ia	2 (1 year)	CA, Multi-level analysis	1-2: .17*	1-2: .08	Buljac & van Workoem (2015)
		Team reflection	Effectiveness					1-2: .20*	1-2: .05	
		Team reflection	Innovation					1-2: .09	1-2: .02	
		Reflection	Performance appraisal quality	54	Ia	2 (1 year)	CA, regression analysis	1-2: .13*	–	Bednall et al. (2014)
	IWB	Team reflexivity	Opportunity Exploration	66	Ia	3 (3 months)	CA, cross-lagged panel model	1-2: .39* 2-3: .36* 1-3: .33*	1-2: .09 2-3: .06 1-3: .25*	Widmann et al. (2019)
		Team reflexivity	Idea Generation					1-2: .33* 2-3: .33* 1-3: .40*	1-2: .10 2-3: .19 1-3: .27*	
		Team reflexivity	Idea Promotion					1-2: .29* 2-3: .31* 1-3: .30*	1-2: .10 2-3: .07 1-3: .24*	
		Team reflexivity	Idea Realization					1-2: .36* 2-3: .28* 1-3: .29*	1-2: .03 2-3: .08 1-3: .21^{+}	

Theoretical categories		Study variables		Sample	Method	MSP (duration)	Analysis	Effects		Study
TLBs	Outcome	TLBs	Outcome					r-values β-values		
Sharing	IWB	Reflection	Innovative Behaviour	52	Ia	3 (1 year)	CA Regression Analyses	1-2: .28** 1-3: .27** 2-3: .31**	–	Bednall & Sanders (2017)
		Reflection	Innovative Behaviour	54	Ia	2 (1 year)	CA, Regression analysis	1-2:.32*	1-2: .13	Bednall et al. (2014)
		Knowledge Sharing	Opportunity Exploration	66	Ia	3 (3 months)	CA, cross-lagged panel model	1-2: .36* 2-3: .36* 1-3: .21*	1-2: 20* 2-3: .14 1-3: .17^{+}	Widmann et al. (2019)
		Knowledge Sharing	Idea Generation					1-2: .31* 2-3: .35* 1-3: .35*	1-2: .20* 2-3: .15 1-3: .03	
		Knowledge Sharing	Idea Promotion					1-2: .31* 2-3: .31* 1-3: .19*	1-2: .29* 2-3: .13 1-3: .13	
		Knowledge Sharing	Idea Realization					1-2: .27* 2-3: .31* 1-3: .23*	1-2:09 2-3: .22* 1-3: .12	
		Knowledge sharing	Innovative Behaviour	52	Ia	3 (1 year)	CA Regression Analyses	1-2: .26** 1-3: .30** 2-3: .41**	–	Bednall & Sanders (2017)

Table 2 (*continued*)

Theoretical Categories		Study variables		N	Method	MSP (duration)	Analysis	Effects		Study
TLBs	Outcome	TLBs	Outcome					r- values	β-values	
Theoretical Categories		Study variables		N	Method	MSP (duration)	Analysis	Effects		Study
TLBs	Outcome	TLBs	Outcome					r- values	β-values	
Sharing	IWB	Knowledge sharing	Innovative behaviour	54	Ia	2 (1 year)		1-2: .16*	1-2: .06	Bednall et al. (2014)
	TP	Knowledge sharing	Performance appraisal quality					1-2: .08	–	
Boundary Crossing	IWB	Boundary spanning	Opportunity Exploration	66	Ia	3 (3 months)	CA, cross-lagged panel model	1-2: .31* 2-3: .47* 1-3: .32*	1-2: .04 2-3: .30** 1-3: .11	Widmann et al. (2019)
		Boundary spanning	Idea Generation					1-2: .27* 2-3: .34* 1-3: .36*	1-2: .02 2-3: .02 1-3: .08	
		Boundary spanning	Idea Promotion					1-2: .27* 2-3: .28* 1-3: .22*	1-2: .02 2-3: .06 1-3: .02	
		Boundary spanning	Idea Realization					1-2: .26* 2-3: .23* 1-3: .24*	1-2: .02 2-3: .05 1-3: .07	
Team activity	TP	Team exploratory search	Team performance	33	Ia	4 (4 weeks)	OLS Regression, CA	1-4: .22 2-4: .01 3-4: .02	.40	Knight (2015)

Note. TLB = team learning behaviors; TP = Team Performance; IWB = innovative work behaviour; CA = correlation analyses; MSP = Measurement Points; 1 = MSP 1, 2 = MSP 2, 3 = MSP 3, 4 = MSP 4; I = quantitativ, II = qualitativ; III = mixed-method; a = Questionnaire, b = Interview, c = Observation. *p < 0.05; **p < 0.01; ***p < 0.001.

Table 3
Quantitative results regarding teams' behavioural change.

Change	TLBs	Study variables	N	Method	MSP (duration)	Analysis	Effects			Study
							r- values	β-values	M (SD)	
Dynamics	Boundary crossing	Boundary spanning	66	Ia	3 (3 months)	Cross-lagged panel model, correlations	1-2: .40** 2-3: .32** 1-3: .28**	1-2: .37** 2-3: .04 1-3: .10	1: 3.81 (.75) 2: 3.71 (.87) 3: 4.60 (.90)	Widmann et al. (2019)
	Team activity	Team exploratory search	33	Ia	4 (4 weeks)	Growth modeling, correlations	1-2: .66** 2-3: .54** 1-3: .22	Effect of time: B = .37	1: 3.09 (0.44) 2: 3.28 (0.40) 3: 3.12 (0.50)	Knight (2015)
Minor change	Team learning behaviour	Team learning behaviour	47	1a	2 (1 year)	cross-lagged regression analysis, correlation	1-2: .74***	1-2: .67***	1: 3.64 (.36) 2: 3.61 (.39)	Van der Vegt et al. (2010)
	Sharing	Knowledge sharing	66	Ia	3 (3 months)	Cross-lagged panel model, correlations	1-2: .39** 2-3: .56** 1-3: .23**	1-2: .14* 2-3: .55* 1-3: .04	1: 4.21 (.61) 2: 4.28 (.56) 3: 4.24 (.60)	Widmann et al. (2019)
		Knowledge sharing	54	Ia	2 (1 year)	Hierarchical regression analysis, correlations	1-2: .48**	1-2: .85***	1: 3.86 (0.85) 2: 4.01 (0.58)	Bednall et al. (2014)
		Knowledge sharing	52	Ia	3 (1 year)	Longitudinal confirmatory factor analysis, correlations	1-2: .56*** 2-3: .52*** 1-3: .52***	–	1: 3.98 (0.70) 2: 3.98 (0.64) 3: 3.95 (0.66)	Bednall & Sanders (2017)
	Constructive Conflict	Constructive Conflict	17	Ia,c	2 (n.a.)	Correlations Mann-Whitney U-Test	1-2: .516	–	1: 4.65 (0.61) 2: 4.74 (0.73)	Van der Haar et al. (2017)
Minor change	Team reflection	Reflection	198	Ia	2 (1 year)	Multi-level Analysis	1-2: .50**	1-2: .51**	1: 3.43 (0.48) 2: 3.49 (0.48)	Buljac & van Woerkom (2015)
		Team reflexivity	66	Ia	3 (3 months)	Cross-lagged panel model, correlations	1-2: .50** 2-3: .63** 1-3: 48**	1-2: .44** 2-3: .44** 1-3: 39**	1: 3.72 (.59) 2: 3.70 (.62) 3: 3.69 (.64)	Widmann et al. (2019)
		Reflection	54	Ia	2 (1 year)	Hierarchical regression analysis, correlations	1-2: .54**	1-2: .70***	1: 4.00 (0.57) 2: 4.01 (0.59)	Bednall et al. (2014)
	Team activity	Keeping up to date	52	Ia	3 (1 year)	CFA, correlations	1-2: .63*** 2-3: .59*** 1-3: .57***	–	1: 4.03 (0.72) 2: 3.99 (0.71) 3: 4.05 (0.77)	Bednall & Sanders (2017)
	Co-con-struction	Asking for feedback	52				1-2: .54*** 2-3: .59*** 1-3: .57***	–	1: 3.56 (0.73) 2: 3.54 (0.73) 3: 3.51 (0.73)	
	Team activity	Helping behaviour	281	Ia	3 (1 month)	Correlations, cross-lagged panel model	1-2: .38** 2-3: .37** 1-3: .26**	1-2: .56*** 2-3: .56*** 1-3:	1: 5.42 (.46) 2: 5.43 (.51) 3: 5.42 (.50)	Wang et al. (2022)

Note. MSP = Measurement Points; TLB = team learning behaviors; 1 = MSP 1, 2 = MSP 2, 3 = MSP 3, 4 = MSP 4; I = quantitativ, II = qualitativ; a = Questionnaire, b = Interview, c = Observation.
*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

work behaviour over time (see Table 2). The results of the studies indicate positive relationships between team reflection and innovative work behaviour (Bednall et al., 2014; Bednall & Sanders, 2017; Widmann et al., 2019). However, the cross-lagged panel model of Widmann et al. (2019) indicates that there are different relationships between team reflection and the various parts of innovative work behaviour.

Three studies found positive effects of sharing on innovative work behaviour over time (Bednall et al., 2014; Bednall & Sanders, 2017; Widmann et al., 2019) with differences on the various parts of innovative work behaviour (Widmann et al., 2019).

Finally, results of two studies show that boundary crossing relates positively to innovative work behaviour over time (Widmann et al., 2019).

4.3. Change of team members' engagement in team learning behaviours over time

In total 15 studies could be identified that investigated behavioural change over time. Eight studies used a quantitative design (see Table 3) and seven studies used a qualitative design (see Table 4). Below, the results are presented according to the categories in which the results can be classified. First the quantitative results are described, followed by the description of the qualitative results.

4.3.1. Quantitative studies

The results of the quantitative studies (N = 8) are classified by correlations, regression coefficients and means. All quantitative studies focus on the frequency of engagement in team learning behaviours. Change in form of dynamics, development or pattern is visible, when the mean value decreases or increases more than $\Delta M = .10$, and the correlation or/and the regression coefficient is not significant (cf. Geiser, 2012). By this classification the results of two studies indicate dynamics. The results of the other studies show that the mean values have changed but the regression coefficients show that there these change is not significant.

Dynamics. One study (Widmann et al., 2019) identified change in boundary crossing over time. Between the first and second measurement point the frequency of engagement in boundary crossing marginally decreased (Mean1 = 3.81, SD = .75; Mean2 = 3.71, SD = .87) and increased between the second and third measurement point (Mean3 = 4.60, SD = .90). The time interval between the measurement points was 3 months. Another study indicates dynamics in team activity (Knight, 2015). Between the first and the second measurement point the frequency of engagement in team activity increased and decreased between the second and the third measurement point. The results of growth modelling analysis show an effect of time on team activity (B = .37, p < 0.05).

Minor change. The other results of the identified studies indicate minor change in sharing (Bednall et al., 2014; Bednall & Sanders, 2017; Widmann et al., 2019), team reflection (Bednall et al., 2014; Bednall & Sanders, 2017; Buljac & Van Woerkom, 2015; Widmann et al., 2019, team activity (Bednall & Sanders, 2017; Wang et al., 2022), co-construction (Bednall & Sanders, 2017) and constructive conflict (Van der Haar et al., 2017). Finally, minor change was identified in team learning behaviours as a holistic construct (Van der Vegt et al., 2010). The intervals between the measurement points vary from 1 month to 1 year. Finally, the results indicate no stability but rather minor change, as the means vary over time. The differences in the means between the measurement points vary between .01 and .15.

4.3.2. Qualitative studies

The results of the qualitative studies concern dynamics (Van Dun & Wilderom, 2021), patterns (Sole & Edmondson, 2002; Zoethout et al., 2017), development (Ballangrud et al., 2020; Erhardt et al., 2016; Love, 2021), and minor change (Edmondson, 2002). In Table 4 the studies are listed. These qualitative studies focus on various characteristics. While Erhardt et al. (2016), Sole and Edmondson (2002), Love and colleagues (2021) as well as Van Dun and Wilderom (2021) focus on frequency of team learning behaviours, Edmondson (2002) and Bellangrud and colleagues (2020) focus on frequency and quality. Zoethout et al. (2017) focus on duration.

Dynamics. The results of Van Dun and Wilderom (2021) indicate chaotic increases and decreases of sharing, co-construction, reflection and team activity. The results are inconsistent for the examined teams and differ in the different contexts. For instance, while the frequency of team learning behaviours increases during team meetings, the frequency of these team learning behaviours decreases during daily work.

Patterns. Patterns are found by two studies regarding team learning behaviours as an overall construct (Sole & Edmondson, 2002), sharing, co-construction, and constructive conflict (Zoethout et al., 2017). Both studies investigated change in team learning behaviours in relation to conditions. The results of Sole & Edmondon (2002) indicate that the increase and decrease of the team's engagement in team learning behaviours are related to the situated knowledge of the team members. If the knowledge is locally situated, that means knowledge is grounded in site-specific work, the teams engage more in team learning behaviours. Zoethout and colleagues (2017) show that the change in sharing, co-construction and constructive conflict depends on the amount of transactivity, which describes the extent to which team members react on each other's reasoning. The more transactivity, the longer are the periods of sharing, co-construction and constructive conflict that recur over time.

Development. While Love and colleagues (2021) identify dynamics in team learning behaviours as a whole construct, two studies identified development in sharing, co-construction and constructive conflict separately (Ballangrud et al., 2020; Erhardt et al. 2016). The results indicate that sharing increased over time, with minor decreases and major increases. Furthermore, the results of the study from Ballangrud et al. (2020) show that in teams in which sharing develops also the quality of sharing increases. Those teams have for instance fewer misunderstandings. Erhardt et al. (2016) could also identify development in co-construction and constructive conflict over time. Love and colleagues (2021) found that team learning behaviours increase over time if the network of the team or the number of the team members increase over time.

Minor change. The results of one study indicate minor change in team reflection and team activity (Edmondson, 2002). The teams

are classified in teams with low engagement in team reflection and low team activity, teams with high engagement in team reflection and low engagement in team activity and teams with high engagement in both team learning behaviours. This engagement changes only by minor increases and decreases over time.

5. Discussion

The aim of this study was to determine what change regarding team learning behaviours is, how team learning behaviours change over time and which types of change occur in natural work teams. Thereby, this review increases awareness of the different types of change for future research, by increasing insights into the different terms used for behavioural change, into the similarities and differences in meaning of those terms, and into what exactly can change.

5.1. Change of team members' engagement in team learning behaviours over time

This study provides insights into the concept of change by understanding of what characteristics of team learning behaviours change and how they change over time. Team learning behaviours change in different ways regarding frequency, duration, intensity, and quality. Variation occurs in various types of change, namely dynamics, pattern, development, and minor change. These four types of change are identified in relation to change in team learning behaviours over time. This present review provides clearer defined types of behavioural change than previous research (cf. Delice et al., 2019; Roe et al., 2012; Wiese & Burke, 2019). The results indicate, that all characteristics can change in the various types of change. Consequently, behavioural change can happen 16 combinations: four types of change and four aspects that can change (frequency, intensity, duration, and quality) that have to be understood to understand behavioural change in detail. These combinations can occur in each of the seven team learning behaviours. For instance, sharing can change in frequency (in number of occurrences) and sharing can also change in intensity (in amount of information). Consequently, there are (4x4x7 =) 112 possibilities how behaviours can change within teams. Previous studies cover only a small proportion of these possibilities. The characteristics of team learning behaviours mostly examined are frequency, and minor change as type of change. Moreover, team reflection and sharing were mostly examined, and storage and retrieval not at all. Therefore, if all types of change regarding team learning behaviours occur in practice cannot be answered, yet.

As the results indicate that identification of various combinations can depend on study design, future studies should make some initial considerations. Behavioural change is identified by using quantitative and qualitative designs, but there are differences found between both approaches. While quantitative study results focused on the frequency of team learning behaviours over time and indicate mostly minor change, qualitative studies identified dynamics, developments and patterns and focused on quality and duration. These differences can be caused by the measurement points. For instance, the measurement intervals could be too large for identifying dynamics in the quantitative studies, because dynamics might appear in shorter time intervals. As qualitative studies zoom on the behaviours within the teams (e.g., by observations), short term change could be identified. In accordance with the conclusions of Lehmann-Willenbrock (2017) the three types of time levels (macro, meso, and micro) were examined in the identified studies. While quantitative studies centred their attention on macro-time and meso-time levels, qualitative studies focused more on meso-time and micro-time levels. Moreover, the number of measurement points differed between the quantitative and qualitative studies. The quantitative studies measured at up to three time points, whereas qualitative studies up to 44. Numerous measurement points are essential for examining real change, particularly for quantitative analyses (Kozlowski, 2015; Roe, 2008). As the results of this review indicate, pattern and development can only be identified with multiple measurement points over a long-time interval. Further differences between qualitative and quantitative studies examining behavioural change in work teams contain the handling of data. Qualitative studies are valuable for examining change in teams without aggregating data (e.g. Kozlowski, 2015). Thereby, processes within teams can be examined more appropriate and causes for differences between teams can be identified. Quantitative studies are more valuable for getting more generalizable results and focus on differences between teams. Moreover, in qualitative studies the sample is selected in a narrower scope. Quantitative studies selected one type of teams (e.g., student teams or work teams) without further selection criteria. Many qualitative studies, however, took more characteristics of teams into account. For instance, Van Dun and Wilderom (2021) selected only high-performing teams, and Love and colleagues (2021) conducted a case study that takes various criteria into account. For understanding behavioural change in work teams in detail, examining influences of team learning behaviours is crucial as various types of change can be caused by numerous team learning conditions, such as task interdependence or team structure. Therefore, when examining change in work teams, teams with similar conditions should be selected, also in quantitative studies. Finally, qualitative and quantitative studies refer to various approaches that differ in the understanding of behavioural change (Van de Ven & Poole, 2005). Qualitative studies seem to aim more often at capturing change as a holistic process. In contrast quantitative studies seem to aim more often at capturing variance of various dimensions, characteristics and the relationships between them (cf. Van de Ven & Poole, 2005).

In summary, the results of this study indicate that team learning behaviours can change regarding frequency, quality and duration in form of dynamics, pattern, development, and minor change (RQ 1). All types of change occur in natural work teams but not all combinations are examined, yet (RQ 2). Although much research on change in work teams is called for in literature (e.g., Collins et al., 2016; Kozlowski, 2015; Lehmann-Willenbrock, 2017; Roe et al., 2012) and the research on team learning over time has increased in the last decade, this review shows that more studies, both qualitative and quantitative, are needed to acquire deeper understanding of behavioural change in teams. In particular, it needs to be investigated how intensity, duration and quality of team learning behaviours change over time.

Table 4
Qualitative results regarding teams' behavioural change.

Categorization		Study variables	N	Method	MSP (duration)	Analysis	Results	Study
Change	TLBs							
Dynamic	Sharing Co-Construction Reflection Team activity	Information sharing Peer support Process Improvement Performance monitoring	5	II a, b, c	5 (between 6 and 12 months)	Content analysis	• There are no consistent results regarding the teams → TLBs increase in some teams and decrease in other teams • There are no consistent results regarding the context → TLBs increase in team meetings and decrease during daily work or inversely	Van Dun & Wilderom (2021)
Pattern	TLB	Team learning	7	II b, c, d	n.a.	Content analysis	• Teams learning by (locally or remotely) situated knowledge • The frequency of the engagement in TLBs change over time • If teams learn by locally situated learning engage more in TLBs • If team learn by remotely situated learning engage less in TLBs	Sole & Edmondson (2002)

Change	TLBs	Study variables	N	Method	MSP (duration)	Analysis	Results	Study
Pattern	Sharing	Sharing	3	II c	4–10 (weekly)	Se-quence analysis	• In relation to transactivity (extent to which team members act on each other's reasoning) • By Sharing the interactional sequence is started followed by other TLBs • The lower transactivity the shorter periods of sharing that recur	Zoethout et al. (2017)
	Co-Construction	Co-Construction					• In relation to transactivity • The higher transactivity the longer periods of co-construction that recurs • Follows after sharing in the interactional sequence	
	Constructive Conflict	Constructive Conflict					• In relation to transactivity • The higher transactivity the longer periods of constructive conflict that recur • No constructive conflict by teams with low transactivity	
Development	TLBs	Collaboration	1	II a,b,c	5 (1 year)	Content analysis	•The collaborative network of the team increases over 15 years •The bigger the network the more team TLBs could be identified	Love et al. (2021)
	Sharing	Communi-cation	3	II b	3 (6 months)	Content analysis	•Engagement in sharing increase over time •Development is caused by a team training •Quality of sharing increases (e.g. misunderstandings could be better discovered)	Ballangrud et al. (2020)
	Sharing	Knowledge sharing	1	II b,d	44 (weekly)	Content analysis	•Increase from 64 times to 117 times •Highest frequency with highest increase •Minor increases and major decreases within one week	Erhardt et al. (2016)
	Co-Construction	Co-Construction					•Increase from 73 times to 101 times •Short time dynamics within one week •Minor increases and major decreases within one week	
Development	Constructive Conflict	Constructive Conflict					•Increase from 46 times to 70 times •Lowest frequency with lowest increase	Erhardt et al. (2016)

Table 4 (*continued*)

Change	TLBs	Study variables	N	Method	MSP (duration)	Analysis	Results	Study
Minor change	Reflection	Reflection	12	II b, c	5 (about 1 month)	Content analysis	●Minor increases and major decreases within one week ●Various frequency of reflection in different teams ●Teams reflect frequently or rarely (or never) over the time ●The quality of reflection can differ over time	Edmondson (2002)
	Team activity	Action					●Various frequency of team activity in different teams ●Teams engage frequently or rarely (or never) in team activity over the time ●The quality can differ over time	

Note. MSP = Measurement Points; TLB = team learning behaviors; 1 = MSP 1, 2 = MSP 2, 3 = MSP 3, 4 = MSP 4; I = quantitativ, II = qualitativ; a = Questionnaire, b = Interview, c = Observation. d = document analysis.

5.2. Team learning behaviours and outcomes over time

Team learning behaviours foster various team learning outcomes over time. Organisations must identify their desired outcomes and understand which behaviours are more likely to lead to the end goal. For example, while sharing is important for future innovative work behaviour (Widmann et al., 2019), promoting sharing has not been shown to enhance team performance over time (cf. Bednall et al., 2014).

However, one team learning behaviour could be identified as important for various team learning outcomes. Team reflection seems to be the most important team learning behaviour to achieve desired future outcomes. Cross-sectional study results (e.g. De Dreu, 2007; Drach-Zahavy & Somech, 2001; Van Woerkom & Croon, 2009), indicate positive relationships to team performance and innovative work behaviour. If team members reflect on their goals, processes, and tasks together, they will ensure progress towards goals and positive future outcomes.

Knowledge sharing seems less important over time. For instance, cross-sectional studies showed that sharing relates positively to team performance (e.g., Staples & Webster, 2008; Van Woerkom & Croon, 2009), but over time no effect could be found. Other results related to co-construction, constructive conflict, and team activity were consistent with previous study results (e.g., Drach-Zahavy & Somech, 2001; Tjosvold et al., 2009; Van den Bossche et al., 2011).

Moreover, research reveals variation over time in relationships between team learning behaviours and team learning outcomes. This change in the effects are characterised by the increase or decrease of the effect size. For instance, Van der Haar et al. (2017) reported correlations for constructive conflict and team performance varying from $r = .51$ ($p < 0.05$) to $r = .65$ ($p < 0.01$). Regression analysis results indicated significant relationships in one-time interval, but not between two other time points. Widmann et al. (2019) found a positive relationship between reflection and opportunity exploration (as part of innovative work behaviour) between the first and the third measurement points but not between the first and second or the second and third measurement points. This change can have methodological and content-related reasons. The change in the relationships over time could be caused by change within the team or the quality of team learning behaviours. Other circumstantial team change, such as new task assignments, could cause significant increase in team learning behaviours during a given interval. Furthermore, the quality of team learning behaviours could have caused change in relationships over time; for instance, when relevant knowledge is shared within the team, it enhances outcomes (cf. Ballangrud et al., 2020).

5.3. Limitations and implications for future research

Although the sample size (N = 15 studies) of this review is limited, this review increases the knowledge on team learning behaviours over time in work teams and on the research gaps that should be addressed to improve in-depth understanding of behavioural change in work teams. It should be noticed that this review provides a first step in getting insights into behavioural change of work teams in natural work settings. Because most studies measure team learning behaviours only two or three times, research utilising more measurement points and shorter time intervals is needed for a deeper understanding of behavioural change in teams. While Roe (2008) indicates that at least five measurement points are needed to understand real temporal change, Kozlowski (2015) suggested at least 30 measurement points to fully capture the process of change. Results indicate that how many measurement points are needed depends on the specific types of change under examination. While for identifying dynamics 5 measurement points could be adequate, for identifying patterns more measurement points are crucial. Furthermore, although qualitative and quantitative studies provide valuable insights, mixed methods studies could provide a more comprehensive understanding. Further investigating change in duration, intensity, and quality of team learning behaviours is required, because that has been largely neglected so far. Moreover, an even bigger challenge, which is needed to fill a gap, is investigating change in combinations of team learning behaviours with their interactions.

The focus of this review was not on finding explanations for how the change occurs. Since most of the selected studies do not consider input variables that could influence behavioural change over time, this needs to be further investigated, as well. Therefore, more qualitative and quantitative studies examining team learning conditions over time, such as task interdependence or team composition are required to understand the causes of change in the various types. Furthermore, in order to understand behavioural change in work teams more studies are needed that focus on various types of outcomes of behavioural change and that provide insights into relationships between various types of change in team learning behaviours and behavioural, cognitive and affective outcomes. For instance, measuring change as a variable by asking how and to what extent team learning behaviours have changed, and analysing how this change relates to various outcomes as well as characteristics of the work context is crucial for increasing insights.

The generalisability of the results is somewhat limited. The majority of the studies were conducted in Europe. Although no differences were found between these results and those conducted in Asia or North America, one must exercise caution when generalising the results worldwide. Additional studies in all areas of the world are needed to gain verifiable insights into behavioural change because cultural differences may play a significant role (cf. Mulder, 2022). Domain specificity should also be considered. Although most of the results do not indicate domain specificity, inconsistent results could be due to the context (cf. Van Dun & Wilderom, 2021).

The results of this review also indicate theoretical implications. Theories can be further developed by including differentiations between the different identified types of change. The definitions of these types have to be clear and distinctive, and they should indicate how the different types can be measured, for instance regarding the amount of required measurement points. Furthermore, it is important to make clear what exactly changes, that is the frequency, intensity, duration and/or quality. As also combinations of different team learning behaviours can occur, theories paying attention to occurrence of change in such combinations and explanations for the interactions would be fruitful for further empirical studies.

5.4. Practical implications

As team learning behaviours change over time, it is important for organisations to consider temporal aspects of their work teams by creating a work environment that enables work teams to reach their goals. Based on the results of this review, the following implications can be drawn to foster work teams in organisations sustainably.

All responsible persons, such as supervisors, team leaders or team members, should be aware of the existence and nature of temporal behavioural change in work teams. Because high levels of engagement naturally decrease over time (as shown by the means of the variables examined in the studies), this awareness will promote intentional and continuous levels of engagement, which is crucial for high team performance. This awareness is the first step towards counteracting decreases in team learning behaviours. Consequently, fostering and preserving high engagement in team learning behaviours must be paid attention to. For instance, if someone, such as a manager, notices that team members work interdependently to accomplish work tasks, a work environment that encourages interaction will likely lead to increased engagement in team learning behaviours (e.g., Van den Bossche et al., 2006; Widmann & Mulder, 2018).

There are study results that indicate only minor change in learning behaviours for teams who have worked together for a long time or who have focused on a single project for an extended period. These teams have probably developed established routines and display less dramatic change in behaviours. Although this change still exist and established work teams should not be ignored, team leaders should pay particular attention to newly-composed work teams or teams with a new work task. These situations may require leadership by establishing work environment, responsibilities, and team structure to optimise engagement in team learning behaviours moving forward.

Finally, because research has shown that fostering team learning behaviours increases performance, all persons involved (e.g. team leaders, team members) must be tuned to team learning behaviours which can lead to desired outcomes. The effect of team learning behaviours on future outcomes seems to decrease over time (e.g., Bednall et al., 2014; Widmann et al., 2019). Therefore, team members' engagement in team learning behaviours should be continuously re-evaluated over the team's entire lifespan to ensure united and lasting commitment.

6. Conclusion

By distinguishing, categorizing, and analysing various types of change studied in previous research, this review enhances the understanding of behavioural change in work teams. Thereby this review increases awareness of the use of different terms of change and uncovers the state of the art, and research gaps. Thus, this review provides suggestions for future research in order to fill current research gaps on behavioural change in work teams for deeper understanding on for instance how such identified change occur. The results indicate that there are four different types of change that can be identified in the engagement in team learning behaviours, namely dynamics, pattern, development and minor change (RQ 1). All the four types could be identified by studies in natural work teams. So far, some types are identified more often than other types. In the limited amount of existing empirical studies minor change was mostly identified, with using a quantitative study design (RQ 2). Furthermore, the results indicate that various team learning behaviours lead to various outcomes. Especially team reflection is important for instance team performance and innovative work behaviour. The results of this review form the basis for implications for practice, as for instance that to sustainably foster performance of work teams, team leaders and team members have to be aware of behavioural change and have to ensure high engagement in team learning behaviours over time. A suggestion for future research contains for instance studies with more than three measurement points and with short time intervals, on the different identified types of change in natural work settings. In particular studies examining change in quality of team learning behaviours and its effect on team performance over time are needed. Furthermore, combinations of

and interactions between these different types need further investigation to increase insights into behavioural change in work teams.

Author contributions

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The author(s) declare(s) that there are no competing interests. All the authors have seen and agree with the contents of the manuscript.

Data availability

No data was used for the research described in the article.

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Studies included in the literature review

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