Team learning behaviors in virtual engagement teams: A literature review

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1. Introduction

When teams are the prime unit of working and learning in organizations – such as is the case in accountancy firms – they face many challenges to use their potential and achieve their goals (Edmondson, Dillon, & Roloff, 2007). Their business environment can be characterized by complexity and ambiguity. This requires teams to engage in team learning behaviors that allow team members to share their skills, knowledge, information, and point of view to modify the team's habits and work procedures depending on what is required (Tannenbaum, Mathieu, Salas, & Cohen, 2012). Team learning behaviors differ from formalized training and are those behaviors that occur while the team is in operation and confirm or alter the team's collective understanding and involve actions such as information sharing, asking critical questions, and experimenting (Wiese & Burke, 2019). Team learning behaviors are essential for teams that engage in decision-making tasks involving the processing and coordinating of information in situations requiring judgment, such as auditing (De Wit, Greer & Jehn 2012; DeChurch & Mesmer-Magnus, 2010). Furthermore, team learning behaviors have consistently been linked to team performance and are considered a robust competitive advantage (Wiese, Burke, Tang, Hernandez & Howell, 2021). For instance, Sessa and London (2008) show that team learning behaviors allow teams to create new ways of working, improve existing workflows, and develop high-quality products and knowledge, even when under time pressure. Furthermore, team learning is essential for the engagement team's decision to be supported with sufficient evidence and thus be of high quality (Monitoring Commissie Accountancy (MCA), 2020). This has led to an increased focus by academics, practitioners, and regulators to understand team learning behaviors' role in team performance in general, but also within the auditing profession (MCA, 2020; Van den Bossche & Nijs, 2021; Nellen, Gijselaers & Grohnert, 2020; Widman, Messmann & Mulder, 2016).

Hierarchical audit teams constitute one of the cornerstones in accountancy firms to conduct audits (Trotman, Bauer & Humphreys, 2015). These teams play an essential role in assuring audit quality. The COVID-19 crisis not only has highlighted the importance of teamwork within auditing, but it also showed that collaborating and learning in dispersed or virtual engagement teams proved challenging (Eulerich, Wagener & Wood, 2021). In that respect, understanding how virtual teams work, learn, and ultimately perform within the auditing

setting is essential for accountancy firms. Virtual teams refer to "groups of geographically and or organizationally dispersed coworkers that are assembled using a combination of telecommunications and information technologies to accomplish an organizational task" (Townsend, DeMarie, & Hendrickson, 1998, p.17). Virtual communication is less rich in information, offers fewer opportunities for asking questions, and is considered more strenuous than face-to-face communication (Shuffler, Wiese, Salas, & Burke, 2010). Extant research suggests that virtual teams are challenged in their learning because of these communication barriers compared to teams operating in face-to-face environments (Ren, 2018). As a consequence, engagement team members may experience difficulties sharing information, have fewer opportunities to ask for help or receive feedback, or engage less in high-quality fraud brainstorming sessions due to a virtual team setting. In addition, dispersed work arrangements can prove problematic for the socialization and acculturation of new and inexperienced auditors (Westermann, Bedard, & Earley, 2014). A disruption in a team's social and organizational context due to virtual teamwork is particularly worrisome for audit engagement teams operating virtually, as this context can affect the quality of the audit process (Detzen & Gold, 2019). The quality of the resulting financial statements depends on the interactions and relationships between engagement team members, and the client's management (Detzen & Gold, 2019; Gibbins, Salterio & Webb, 2001).

The disruptive nature of virtual teamwork is particularly evident for the auditing profession (Eulerich, Wagener & Wood, 2021), as the sudden shift to increased virtual teamwork due to the COVID-19 pandemic only accelerated a trend that was already ongoing within the auditing profession (Downey, Obermire & Zehms, 2020; Teeter, 2010; Brazel, Agoglia, & Hatfield, 2004; Teeter, Alles, & Vasarhelyi, 2014). Previous experiences with remote auditing, international group audits, and offshoring have created a hotbed for virtual teamwork to grow in the auditing profession. As audit firms strive to unlock the strategic advantages of virtual teamwork, such as reduced travel expenses, reduced carbon emission, worldwide availability of regionally available expertise, and increased flexibility (Hanes, 2013), they have increasingly created dispersed and virtual work arrangements. Furthermore, virtual teamwork offers the flexibility necessary to retain and attract millennial audit talent who prefer less rigid work arrangements and the improved work-life balance associated with virtual teamwork (Durocher, Bujaki & Brouard, 2016). The culmination of previous

experiences and the lessons learned by audit firms worldwide have prompted audit firms to leverage the potential of virtual working arrangements, triggering a U.S. Big 4 firm to no longer require their employees to work from the office but offers the opportunity to work exclusively remotely and flexibly (DiNapoli, 2021).

The crucial role of team learning behaviors for team performance, combined with the potential adverse effects of virtual teamwork and the long-term commitment of the audit profession to virtual work arrangements, make understanding virtual team's learning behaviors not only a consideration of the past and present but also an integral part of the future of the auditing profession. Therefore, it is remarkable that only limited academic evidence and insights on team learning behaviors in virtual teams are available (Wiese et al., 2021). Research on virtual teams, in general, is particularly fragmented across multiple streams, all with their conceptualization and nomenclature for virtual teamwork (Raghuram, Hill, Gibbs & Maruping, 2019). Seminal literature reviews on team learning behaviors have explicitly excluded evidence from virtually operating teams as virtual teams' nature influences how these teams learn (Decuyper, Dochy & Van den Bossche, 2010; Nellen, Gijselaers & Grohnert, 2019; Van den Bossche & Nijs, 2021). In addition, previous research has predominantly utilized student teams performing experimental tasks as respondents, while these results are difficult to generalize to teams of professionals working on significant tasks for the organization (Cramton, 2001; Cramton, Orvis & Wilson, 2007). Furthermore, we need to acknowledge specific circumstances in the auditing profession, such as the utilization of standardized methods (Knechel, Naiker, Pacheco, 2007), the substantial level of professionalization, and the hierarchical nature of reviewing and the engagement team's structure (Trotman, Bauer & Humphreys, 2015). These circumstances can potentially affect or alter the relationship between team learning in virtual teams and their performance and thus warrant consideration by academics.

Understanding how team learning behaviors affect virtual engagement teams is the central research question in the FAR project "Virtual Audit Teamwork: working, learning, and delivering high audit quality virtually." The purpose of this literature review is twofold: On the one hand, we aim to provide an overview of available insights on remote work and virtual teamwork in the auditing profession. On the other hand, we strive to provide an overview of

available literature on team learning behaviors in virtual teams to identify drivers and facilitate conditions of team learning in virtual teams. A systematic review of how team learning behaviors are affected by virtual teamwork is still missing, and we know little about how these insights relate to the auditing profession. We start with synthesizing the evidence and insights from auditing research in settings where dispersion is naturally occurring, such as international group audits, offshoring, and remote auditing. Next, we provide an overview of the available literature on team learning in virtual teams from other professions and sectors, focusing on evidence from natural work teams. The outline of this literature review is as follows. In section two, we provide a theoretical background on the main concepts of this literature review: team learning behavior and virtual teams. Section three lays out the methodology used for this literature review. In sections four and five, we lay out the results from the literature search on remote auditing, offshoring, and international group audits and provide an overview of current literature on team learning behaviors in virtual teams. Section six concludes and provides an outline for future research and a research agenda.

2. Theoretical Framework

Virtual teams

Virtual teams and virtual teamwork have been conceptualized and defined using synonyms such as teleworking, computer-mediated collaboration, dispersed teamwork, and virtual teamwork. Regardless of the specific conceptualization, all definitions of virtual teams share and combine the following three elements (Raghuram, Hill, Gibbs & Maruping, 2019). First, a virtual team has a certain degree of geographically, temporal, or organizational dispersion. Second, these teams rely to a varying degree on information technology for their communicational needs due to this dispersion level. Third, virtual teams are, in essence, still teams, a group of people working interdependently towards a common goal or task that identifies as a single social entity (Raghuram et al., 2019). The implementation of virtual teams and virtual teamwork arrangements has seen a drastic increase throughout organizations worldwide (Dulebohn & Hoch, 2017). Audit firms have increasingly relied on dispersed work arrangements in settings such as internal group audits and offshoring to unlock the strategic advantages of virtual teamwork. The strategic advantages are considerable and entail reduced traveling expenses and making regionally present expertise globally available (Teeter

et al., 2014). In recent years the utilization of international group audits, offshoring, and remote auditing and thus the presence of virtual teams within the auditing profession has been increasing, a trend that has only been reinforced by the implications of the COVID-19 pandemic (Teeter et al., 2014; Eulerich et al., 2021).

When studying virtual teams, it is essential to note that teams are not exclusively virtual or face-to-face (Gilson, Maynard, Young, Vartiainen, Hakonen, 2014). Whereas the previously mentioned elements of dispersion, reliance on technology, and existence as a team dealt with determining whether a team is a virtual team or not, the concept of team virtuality determines the extent to which specific outcomes related to the virtual nature of a team are experienced (Costa, Handke, O'Neill, 2021). The concept of team virtuality refers to the varying degrees that a team can be considered or is experienced as virtual by its constituents (Handke et al., 2020; Costa et al., 2021). A team's virtuality is dependent on the level of dispersion, the frequency of communication, the medium through which team members communicate, and the information richness associated with the chosen communication medium (for further clarification, see figure 1). Highly virtual teams communicate infrequently and use methods low in information richness, such as emails, and are expected to experience considerable challenges due to virtual teamwork. Teams with low virtuality communicate frequently using technology rich in social cues, such as video conferencing. Teams with low virtuality are considered relatively similar to a collocated, face-to-face operating team (Gilson et al., 2014; Hoch & Kozlowski, 2014). The extent to which teams experience team virtuality could determine how virtual teamwork can impede or stimulate crucial team processes, such as coordination, communication, and training, and thus affect team performance and judgment quality (Wiese et al., 2021; Wiese & Burke, 2019).
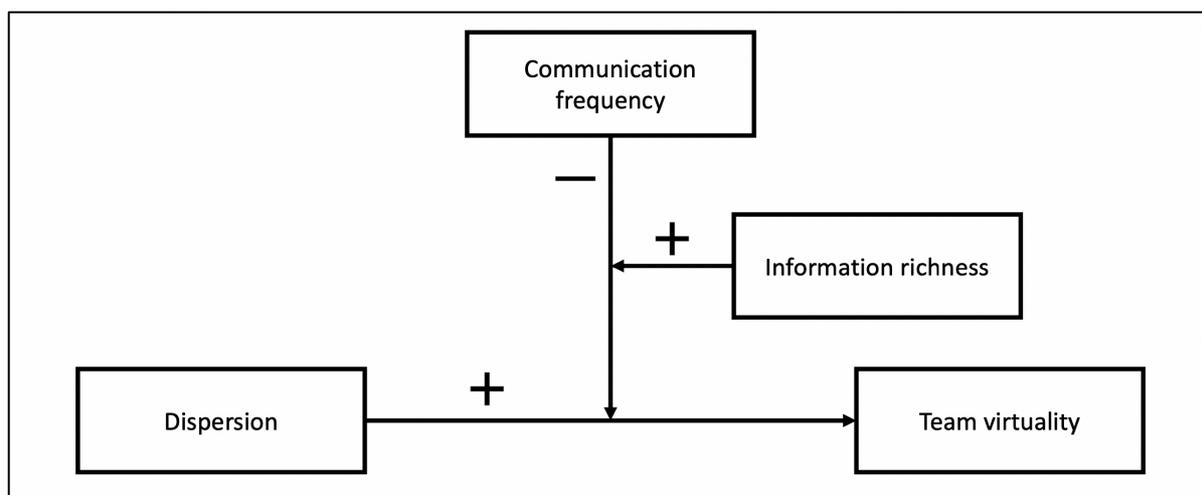
Figure 1: Drivers of team virtuality

Previous literature in auditing has mainly studied the effect virtual work arrangements have on outcomes such as professional skepticism (Kuselias, Agoglia & Wang, 2017; Sorensen & Ortegren, 2020), communication (Downey, Obermire & Zehms, 2020; Downey & Bedard, 2019; Hunton & Harmon, 2004; Teeter et al., 2010), and feedback (Brazel, Agoglia & Hatfield, 2004; Andiola, Downey, Spilker & Noga, 2018) that are essential drivers of audit quality. However, previous auditing literature has underexposed the underlying behaviors that lead to these outcomes (Downey et al., 2020). Evidence on the impact that virtual teams have on the mechanism and outcomes related to effective engagement teams and high-quality audits is therefore limited and only generalizable to how virtual teams are currently employed within the auditing setting. The unique characteristics of auditing, such as high professionalization, structured tasks, and the hierarchical review and feedback process, deserve particular attention from academics as they impact the dynamics and teamwork within a team (De Greer et al., 2018; Handke et al., 2020). While these characteristics are prevalent within the auditing profession and potentially affect virtual engagement teams outcomes, the empirical academic evidence about the effect of the working conditions prevailing within the auditing profession on the effectiveness of virtually operating engagement teams remains scarce. This literature review aims to synthesize the currently available insights on the impact of virtual teamwork in the auditing profession and present a research agenda for future research on virtual teams within auditing to address the current gaps in understanding.

Team learning behaviors

Team learning behaviors positively affect team effectiveness (Senge, 1990; Decuyper et al., 2010; Van den Bossche & Nijs, 2021). The pivotal role of team learning behaviors has been demonstrated in many studies, and received increasing attention over time (Wiese et al., 2021; Decuyper, Dochy & Van den Bossche, 2010; Nellen, Gijselaers & Grohnert, 2019; Van den Bossche & Nijs, 2021). In the broadest sense, team learning behaviors can be considered any collaborative action that supports a change or affirmation of the team's collective understanding (Wiese & Burke, 2019). Furthermore, team learning can be seen as an outcome, such as new knowledge generated (Ellis, Hollenbeck, Ilgen, Porter, West, & Moon, 2003), or as a process, with specific underlying behaviors geared towards the creation of knowledge (Wiese et al., 2021; Edmondson, 1999). The current literature review conceptualizes team learning as a process and is particularly interested in the concrete behaviors underlying the process of team learning because explicit behaviors are manipulable and malleable by practitioners and can be targeted by deliberate actions. These individual behaviors allow for the change or affirmation of collectively held mental representations and understanding. Engaging in these behaviors indicates team learning occurring through the sharing, discussing, and combining personal knowledge and experiences and internalizing them within the team.

Previous literature has operationalized and defined team learning in a wide variety of ways with an equally wide variety of underlying individual learning behaviors that overlap to a certain extent (for a complete overview of the different conceptualizations and behaviors, I refer to table 2 on page 4 of Wiese et al., 2021). The different conceptualizations of team learning behaviors mainly differ on two points. First, conceptualizations of team learning behaviors differ on the role a behavior has, either facilitating or indicating team learning. Some behaviors such as knowledge sharing or retrieval of knowledge foster the conditions for team learning to happen, whereas engaging in critical conflict and actively managing information is a sign of team learning. The second dimension on which conceptualizations of team learning differ is where the locus of origin of the newly generated knowledge is, either within or outside the confines of the team. For instance, when engaging with an external expert, teams receive novel and unique information that was not present beforehand but which they internalize after engaging with this new knowledge. Wiese et al. (2021) provide a

taxonomy that allows for the reconciliation and consolidation of the wide variety of different team learning behaviors by distinguishing three groups of team learning behaviors: fundamental, intra-team, and inter-team learning behaviors. For this review, we will adopt this taxonomy to assess findings related to team learning behaviors with a coherent and encompassing framework. We will discuss fundamental, intra-team, and inter-team learning behaviors in turn.

Fundamental team learning behaviors are those behaviors that provide the groundwork for team learning to occur (Wiese & Burke, 2019) and are closely related to the quality of the content communicated within a team (Downey et al., 2020). There are three distinct types of behaviors that constitute fundamental learning behaviors: information sharing, information storage, and information retrieval (Wilson et al., 2007). Information sharing is defined as simply distributing information amongst teammates and is considered essential to the team's functioning in general (Kozlowski & Bell, 2008). Information storage, defined as the preservation and retention of knowledge, preserves newly acquired knowledge. Information retrieval is defined as the recovery and utilization of stored knowledge (Wilson et al., 2007). It ensures team learning over time as these behaviors increase the shared nature and integrity of the acquired knowledge (Wiese & Burke, 2019). Information that is shared, stored, and retrievable acts as the medium through which teams can develop emergent states, such as psychological safety, that underly excellent team performance (Salas, Cannon-Bowers, & Johnston, 1997; Wiese et al., 2021; Mesmer-Magnus & DeChurch, 2009; Marlow et al., 2018). Furthermore, fundamental team learning behaviors such as information sharing have proven to increase the level of decision informity underlying auditors' decision and is thus seen as a driver of audit quality and audit efficiency (Duh, Knechel & Lin, 2020).

Intra-team team learning behaviors are behaviors associated with forming a shared mental representation, addressing shortcomings in the team's collective knowledge, or critically exploring different points of view held in the team to formulate and test alternative hypotheses (Drach-Zahavy & Somech, 2001; Edmondson, 1999; Savelsbergh, van der Heijden, & Poell, 2009). Intra-team team learning behaviors go beyond simply sharing information; they imply actively managing and applying structure to pieces of information and knowledge that impact the collective knowledge state of the team (Wiese & Burke, 2019). By asking

questions and providing feedback, team members establish clear communication and knowledge exchange (Edmondson, 2003; Sharma & Ghosh, 2007). Furthermore, intra-team learning behaviors form and shape the emergent states that are crucial to excellent performance (Lewis, Lange, & Gillis, 2005; Oertel & Antoni, 2015; Edmondson, 1999; Nembhard & Edmondson, 2009). Intra-team learning behaviors such as engaging in constructive conflict and experimentation assist teams in learning from errors and disseminating lessons learned and are a strong predictor of future learning and performance (Michael, 1973; Sitkin, 1992; Schein, 1993). Intra-team learning behaviors, such as co-construction and constructive conflict, uniquely predict team effectiveness and performance (Wiese et al., 2021).

In contrast to the internally oriented fundamental and intra-team learning behaviors, *inter*-team learning behaviors occur in interactions with actors outside the confines of the team. The actions or behaviors underlying inter-, and intra-team learning, such as asking questions, seeking feedback, and other forms of acquiring new knowledge, are similar. The difference between intra- and inter-team learning is mainly conceptual and concerned with the locus of where the newly generated knowledge originated, either within or outside the team's confines (Wiese & Burke, 2019). However, the information gained from actors outside the confines of the team is very likely to be unique and valuable. It provides a different perspective from the knowledge present within the team (Wong, 2004). Inter-team learning facilitates team learning, mainly through exploring and integrating new perspectives and knowledge, and is a strong driver of team performance (Marrone, Tesluk, & Carson, 2007). Particularly in a complex, global environment, internalizing and integrating external information is necessary as the learning demands of such an environment surpass that of a learning capacity of the internal environment and processes of a team (Joshi, Pandey, & Han, 2009; Ancona & Caldwell, 1992; Bresman, 2010; Wong, 2004). Consulting experts and advisors that operate outside of the confines of the engagement team is commonplace withing the auditing professions. Major auditing firms have been utilizing inhouse technical experts to advise engagement teams dealing with issues involving complexity and risk, such as material and complex transactions related to mergers and acquisitions, or complex valuation issues such as goodwill impairments (Gold, Knechel & Wallage, 2012).

As mentioned before, engaging in any type of learning behaviors does not in itself ensure team learning. However, all three types of learning behaviors have to work in parallel with each other to promote optimal levels of team learning (Wiese & Burke et al., 2021). Furthermore, it is also important to note that team learning is not the sole driver of excellent team performance. The behaviors and processes associated with team learning are both input and outcome for emergent states that contribute to the team's performance (Nellen et al., 2019). Emergent states can be defined as "constructs that characterize properties of the team that are typically dynamic in nature, and vary as a function of team context, inputs, processes, and outcomes" (Marks, Mathieu & Zaccaro, 2001, p. 357). Although emergent states are closely related to team learning, they are a distinguishable phenomenon or construct and can potentially stimulate or prevent team learning from occurring (Ilgen et al., 2005). Several emergent states mediate the path between team inputs and, ultimately, team performance. Edmondson & Lei (2014) indicate that team inputs such as team composition, leadership, and organizational resources shape the conditions for teams to feel psychologically safe to share sensitive information amongst team members. Once a sufficient level of psychological safety has been reached within the team, team members feel free to share information and critically discuss this information, experiment, and test alternative hypotheses. By doing so, team members form a shared mental representation of the environment and the challenge at hand and engage in learning. It is how team learning behaviors contribute to team performance and team decision quality (Edmondson & Lei, 2014).

The link between team learning behavior and team virtuality
It is reasonable to assume that the extent to which a team can be considered virtual impacts how teams can engage in team learning behaviors and subsequently impacts team effectiveness, performance, and decision quality (Ren, 2018). First, the extent to which a team can be considered virtual limits the amount of information available to the team and its members due to a reduction of social cues (Handke et al., 2020). Increased team virtuality implies that less information about the team's current situation, such as the functioning and advancement towards deadlines, is available to the leader and team members, potentially limiting team leaders and members' ability to communicate and share information (Zaccaro & Bader, 2003). Second, the extent to which a team can be considered the virtual further impacts the extent to which teams experience barriers to their communication and can share

the available information. As workers increasingly collaborate virtually, they experience higher barriers to giving and receiving feedback, have fewer opportunities to learn from mistakes and have fewer opportunities to ask follow-up questions. Third, increasingly working in virtual teams can distort or interrupt team dynamics relevant to the team's effectiveness and performance. The remote characteristics of virtual teams make it difficult to establish effective routines, deal with conflict adequately, gain familiarity with coworkers, build trust amongst team members, and ensure team cohesion (Hacker et al., 2019). Fourth, virtual teamwork can disrupt processes or diminish the resources necessary for team learning at the organizational level. When an organization increasingly adopts virtual work arrangements, firms experience more barriers to sharing and propagating their organizational values, hindering new and inexperienced employees from adequately familiarizing and identifying themselves with the company. These factors cause virtual teams to show lower performance levels regarding group decision effectiveness and the time needed to reach decisions than face-to-face teams (Hertel, Geister & Konrad, 2005).

Virtual teamwork in auditing and team learning

These findings are particularly worrisome for the auditing profession, where regulators have expressed considerable doubt about the quality of the judgments passed by auditors (MCA, 2020). Concepts such as communication, feedback, and professional skepticism are essential to ensuring high-quality audits and are closely related to fundamental, intra-, and inter-team learning behaviors (Kuselias, Agoglia & Wang, 2017; Sorensen & Ortegren, 2020; Downey, Obermire & Zehms, 2020; Downey & Bedard, 2019; Hunton & Harmon, 2004; Teeter et al., 2010; Brazel, Agoglia & Hatfield, 2004; Andiola, Downey, Spilker & Noga, 2018). Engaging in learning behavior is considered a strategy to counter regulators' critiques and boost the quality of auditors' judgments. In addition, previous literature considers engaging in team learning behaviors essential in settings where professionals are faced with complexity and ambiguity, which is particularly the case in the auditing profession (Wiese et al., 2021). Furthermore, the auditing profession is characterized by highly professionalized employees, a hierarchical review and feedback structure, and formalized and structured working methods (Trotman, Bauer & Humphreys, 2015). Previous literature has indicated that the unique characteristics of the auditing profession potentially affect the relationship between team learning and the setting of virtual teamwork. For instance, hierarchical leadership styles are

less effective in virtual teams than teams operating in collocated, face-to-face settings (Hoch & Kozlowski, 2014). In addition, working under time and budget pressure is considered commonplace in the auditing profession (Trotman, Bauer & Humphreys, 2015), potentially further exacerbating the negative impact that virtual teamwork can have on the formulation of well-supported and high-quality judgments required from auditors (Handke et al., 2020). In conclusion, understanding how virtual teamwork affects the team learning behaviors of an engagement team is crucial for audit firms to respond to the criticism by regulators on the one hand and the increased implementation of virtual teamwork within the auditing profession on the other hand. This review will assist in providing a synthesis of the available insight derived from the auditing profession concerning virtual teamwork and dispersed work arrangements and help identify opportunities for future research.

3. Method

For this literature review, two individual systematic literature searches have been performed. The first search was mainly to identify relevant papers related to virtual teamwork within the auditing profession. The second search has a broader orientation geared towards identifying papers concerning the relationship between virtual teamwork and team learning behaviors. Both searches were performed in the third and fourth quarters of 2021. Details of the search strategy are included in Appendix A.

4. Insights about virtual teamwork in the setting of remote auditing, international group audits, and offshoring

Dispersion, virtual teamwork, and team virtuality in the auditing profession
Virtual teamwork in auditing has mainly been studied from the context of international group audits, offshoring, and remote working (Hunton & Harmon, 2004; Teeter et al., 2010; Hanes, 2013; Sunderland & Trompeter, 2017). Considering that these working arrangements have a certain degree of dispersion, they are a good starting point to assess what topics and methods have been used to understand the impact of virtual teamwork on the auditing profession.

The papers included for this review predominantly assessed remote work arrangements in the audit profession on the individual level (Hunton & Harmon, 2004). The studies included predominantly use geographic dispersion-based conceptualizations of dispersion (Hanes, 2013; Downey et al., 2020). Dichotomous operationalizations of dispersion are preferred over dimensional operationalizations. The choice for this operationalization is reflected in, and driven by, the preference for studying dispersion using experimental methods that imply a comparison of virtual or remote settings versus a collocated setting. None of the papers analyzed utilized a measure of team virtuality to assess the impact of virtual work arrangements on the auditing profession. The studies included in this review demonstrate that although various audit work is performed in a dispersed manner, these dispersed work arrangements present in auditing do not necessarily imply virtual teamwork. The work arrangements described in dispersed audit work involve reliance on communication technology to a certain extent, but the extent to which people operate in a team varies. Offshoring and international group audit fulfill the first two criteria of being a virtual team, but audit staff engaged in these work arrangements do not necessarily perform their work in a team setting (Sunderland & Trompeter, 2017; Barrett, Cooper & Jamal, 2005; Brazel, Agoglia & Hatfield, 2004; Andiola, Downey, Spilker & Noga, 2018). The setting of remote auditing fulfills all of the criteria to consider this setting as one in which virtual teams are utilized (Teeter et al., 2010). This highlights that the virtual nature of a team is considered mainly a setting within auditing and not as an individual characteristic of a team that can act as an input that can potentially be manipulated. Evidence from remote auditing-related studies is much more indicative of how virtual teams operate within the auditing profession, as these work arrangements fulfill the criteria for virtual teamwork.

Outcome measures studied in relation to dispersion in the auditing profession
The papers included in this review have mainly studied the impact of virtual teamwork on the auditing profession have mainly in relation to communication, feedback, and professional skepticism, which we will discuss in turn.

Communication is the extent to which relevant information is shared on time (Srikanth & Puranam, 2011; Downey, Obermire & Zehms, 2020; Downey & Bedard, 2019; Hunton & Harmon, 2004; Teeter et al., 2010; Hanes, 2013; Sunderland & Trompeter, 2017). The

literature included in this study demonstrates that an increase in dispersion leads to decreased communication (Downey et al. 2020; Downey & Bedard, 2019). When team members collaborate in a virtual setting and operate in reduced proximity, communication suffers as team members have less opportunity to share information. Furthermore, dispersion places a higher demand on the content included in the communication between team members. In the context of auditing, communication demands can be further exacerbated by specific client characteristics such as the size and regulatory status of the client, first-year client, a component statutory audit, a greater number of component auditors, and other potential barriers such as language and cultural barriers (Downey & Bedard, 2019). Communication mediates the relation between distribution and dimensions of team performance relevant to auditors, such as the auditors' perceptions of the team's efficiency, their commitment to excellence, overall work quality, the timeliness of the audit, and the team's ability to innovate and act creatively (Peecher, Solomon &Trotman, 2013; PCAOB 2014: Downey, Obermire & Zehms, 2020). A negative impact of dispersion on the communication within an engagement team has a negative relation with the effectiveness of the engagement team (Downey et al., 2020).

Performance feedback is heavily relied upon in public accounting to train less experienced professionals and maintain firm quality standards (Andiola, 2014). It is viewed as both a quality control mechanism (Gibbins & Trotman, 2002; Rich, Solomon, & Trotman, 1997) and a tool in developing and coaching auditors as they progress through the organizational hierarchy and has an implicit face-to-face aspect to it (Westermann, Bedard, & Earley, 2014; Andiola, 2014). Due to technological advancements such as online work papers and email, auditors have more alternative methods of review and feedback than ever before, negating or limiting this implied collocated nature of providing and receiving feedback. Changes in performance feedback due to virtual teamwork may affect audit quality and audit professionals' development (Brazel, Agoglia, Hatfield, 2004). The studies included in this review mainly studied the impact of dispersion on the recipient of the feedback, their interpretation of remotely received feedback, and their response to receiving feedback digitally. Overall, the literature indicates that receiving feedback in a dispersed audit setting is less effective (Brazel, Agoglia & Hatfield, 2004; Andiola, Downey, Spilker & Noga, 2018). Preparers anticipating a virtual review are less concerned with audit effectiveness and

produce lower quality judgments. They are more efficient while preparing but feel less accountable and are more likely to influence last year's working papers. Virtually receiving feedback and a virtual review directs the preparers' behavior toward efficiency over quality. Not only is the preference for efficiency or effectiveness impacted, but a virtual review stimulates preparers to adopt a more heuristic approach instead of a more systematic one (Brazel, Agoglia & Hatfield, 2004). Furthermore, receiving feedback digitally lowers satisfaction with negative feedback, but recipients are equally satisfied with positive feedback regardless of whether the positive feedback is given virtually or face-to-face. However, negative feedback provided by a reviewer that operates at a distance can foster feelings of hostility and rejection as such feedback is perceived to be threatening (Andiola, Downey, Spilker & Noga, 2018).

Professional skepticism is an attitude that includes a "critical assessment of audit evidence" (AICPA, 2010, PCAOB, 2010), which includes involves seeking information from knowledgeable persons, considering client reactions, and asking follow-up questions (AICPA, 2013). An essential aspect of professional skeptical behavior is gathering enough and substantial evidence to serve as the basis of auditors' judgments. The literature in this review demonstrates that an increase in dispersion negatively affects the content and number of follow-up questions asked (Bennet & Hatfield, 2018; Kuselias, Agoglia & Wang, 2017; Sorensen & Ortegren, 2020). As auditors experience lower levels of social presence due to increased dispersion, they have shorter interactions, discussions go less back and forth, fewer questions are asked, and fewer relationship-building statements are made (Bennet & Hatfield, 2018).

While increasing dispersion reduces the length, the quality of the content of the interaction, and negatively affects the ability of auditors to engage in skeptical behaviors, the papers included in this review also identified a positive relationship between dispersion and professional skepticism. Previous research has shown auditor judgments can be biased due to a supervisor's preference as subordinates experience incentives to foster a positive image of them with their supervisors (Peecher, 1996; Wilks, 2002; Peecher, Piercey & Rich, & Tubbs, 2010; Kuselias, Agoglia & Wang, 2017). The literature included in this study indicates that younger, inexperienced auditors are less likely to be influenced by the preference of their

supervisor as a lower social presence reduces the incentive for young auditors to engage in impression management (Kuselias, Agoglia, Wang, 2017). However, these incentives are dependent on the duration of the membership of this engagement team as this effect is partly mitigated by a longer-term collaboration (Godar & Ferris 2002, Saunders & Ahuja 2006; Kuselias, Agoglia, Wang, 2017). For instance, Sorensen & Ortegren (2020) find that distributed auditors may feel that nurturing a relationship with a distant supervisor is more important to their careers when serving on an engagement team for an extended period than when assigned temporarily to an engagement.

Virtual teamwork in auditing and fundamental, intra-, and inter-team learning behaviors

Fundamental team learning behaviors are those behaviors that involve the sharing, storing, and retrieving of information within a team (Wiese & Burke, 2019) and share a close connection with the communication patterns that are present within the team (Downey et al., 2020). Fundamental learning behaviors lay the foundation for the opportunities and the content of communication and seem to create the conditions for teams to engage in successful and high-quality communication (Downey & Bedard, 2019). This indicates that fundamental team learning behaviors mediate the pathway between dispersion and communication. Intra-team learning behaviors are those behaviors that form a shared mental representation, address shortcomings in the team's collective knowledge, or critically explore different points of view held in the team to formulate and test alternative hypotheses (Drach-Zahavy & Somech, 2001; Edmondson, 1999; Savelsbergh, van der Heijden, & Poell, 2009). The papers included in this review indicate that intra-team learning behaviors set the stage for engaging in behaviors associated with providing feedback, such as defining gaps in the knowledge held within the team and aligning mental representations (Edmondson, 2003; Sharma & Ghosh, 2007), and professionally skeptical behaviors such as challenging opposed points of view and asking follow-up questions. The papers included in this review indicate that intra-team learning behaviors seem to be an appropriate mechanism to assess the impact of dispersion on emergent states such as feedback and professional skepticism.

Inter-team learning involves integrating unique and vital knowledge held outside of the confines of the team. The papers included in this review indicate that inter-team learning behaviors partly mediate the path between dispersion and professional skepticism. In

general, mainly the younger and less experienced auditors are tasked with gathering information from important actors, such as the client firm managers, outside the team's confines. When being tasked with collecting this unique and vital evidence, younger auditors often experience a social mismatch which can be detrimental to the frequency of communication, the amount of information requested, and the response to this new information. The literature included in this review indicates that increased dispersion lowers the threshold for young auditors to address more knowledgeable client managers due to a social equalization associated with electronic communication (Bennet & Hattfield, 2013). In addition, auditors are more likely to request additional evidence from their clients when communicating electronically. However, auditors request additional information from clients; they ask significantly fewer follow-up questions. Although experienced auditors experience less social mismatch when requesting information from important actors outside the confines of the team, overall the ability of auditors to ask follow-up questions, collect relevant evidence is negatively affected by an increase in dispersion (Bennett & Hatfield, 2013; Saiewitz & Kida, 2018).

5. Insights about team learning behaviors in virtual teams

Previous literature from virtual teamwork in an auditing-specific context has provided us with insights from research on dispersion specific to the auditing sector, but with limited insight on how team learning behaviors occur in virtually operating teams in general. The second part of this literature review explores virtual team learning behaviors from a broader perspective, including literature on professions and settings such as health care and education. We focus on the following topics of interest in this literature on identifying drivers and inhibitors of fundamental, intra-, and inter-team learning behaviors.

Drivers of team learning behavior in virtual teams.
The papers included in the review have predominantly determined team virtuality as the primary inhibitor of team learning behaviors (Allmendinger, 2010; Cordes, 2016; Schultze & Brooks, 2019; Nilsen, 2010; Lundin Magnusson, 2003; Janssen & Bodemer, 2013). As mentioned before, team virtuality refers to the varying degrees that a team can be considered virtual (Costa et al., 2021). The varying degree of the virtual nature of a team can affect the

construction of verbal and informal information. A team's virtuality is dependent on the level of dispersion, the frequency of communication, the medium through which team members communicate, and the information richness associated with the chosen communication medium (Costa et al., 2021). The papers included in this study have conceptualized team virtuality in three different ways: dichotomous (Allmendinger, 2010; Nilsen, 2010; Jansen & Bodemer, 2013; Kerr & Murthy, 1994; Andres, 2010; Andres & Ship,2010), dimensional (Schultze & Brooks, 2019; Lundin & Magnusson, 2013; Staples & Wessler, 2008; Kirsner & van Bruggen, 2004; Dixon, 2017; Shi & Weber, 2018; de Jong, Dirks & Gillespie, 2016; Håkkinen, 2004), and as the setting of the research (Peñarroja, Oreno, Zornoza & Ripoll, 2015; Ortega, Sanchez, Manzanes, Gil & Rico, 2010, Cordes, 2016). The more recent papers prefer a dimensional operationalization of team virtuality.

Fundamental team learning behaviors

The papers in this review indicate that team virtuality has a negative impact on fundamental learning behaviors. Team virtuality negatively influences the extent to which team members experience psychological proximity and immediacy or the extent to which they feel connected to the team and its work. In turn, lower immediacy is associated with lower involvement from team members (Chidambaram & Tung, 2005) and negatively affects team behaviors such as communication and information exchange (DeLuca & Valacich, 2006). Furthermore, increased team virtuality limits the extent to which verbal messages are supplemented with physical or nonverbal stimuli, such as posture, eye contact, facial expression, tone of voice, reducing the media richness of communication (Dennis, Fuller & Valacich, 2008). This reduction in information richness of communication reduces the effectiveness of communication but also increases the extent to which communication breakdowns and misunderstandings occur (Andres & Shipp, 2016).

Intra-team learning behaviors

The papers included in this review indicate that team virtuality has a negative impact on intra-team learning behaviors. High team virtuality impairs this process and limits the extent to which team members can synchronize feedback and ask a range of follow-up questions. In turn, this inhibits the team member's ability to form a shared mental representation and identify where other relevant information resides within the team (Andres & Shipps, 2010),

reducing the extent to which team members have a shared understanding (Miranda & Saunders, 2003) and experienced higher intra-team conflict (Hinds & Mortensen, 2005). Furthermore, team members experienced increased psychological distance. They thus were limited in their awareness of team members' need for encouragement and the extent to which team members had their previously held beliefs confirmed or altered. In turn, teams with low levels of virtuality, such as collocated operating teams, found it easier to ask questions and clarify statements during feedback exchanges between team members.

Inter-team learning behaviors

The papers included in this review suggest that team virtuality has a positive relationship with inter-team learning behaviors. Inter-team learning often involves an asymmetry in knowledge as teams look for unique and valuable information that is currently not available within the team but resides at an actor that is located outside the confines of the team. However, the opportunity of virtual collaboration lowers the perceived costs, such as traveling and entertainment costs, of the team establishing connections with external experts and increases the opportunities for information exchange and learning from external experts. Particularly engaging in two-way communication where both team members and external experts can describe problems, inform parties involved, explain and confirm new knowledge, and ask and answer questions synchronously further enhances the opportunities for learning of external experts (Nilsen, 2010).

Facilitating conditions of team learning behaviors

In addition to identifying team virtuality as a driver of fundamental, intra-, and inter-team learning behaviors in virtual teams, the papers included in this review identified several emergent states that facilitate team learning behaviors in virtual teams: task interdependence, collective efficacy, collaboration design, and professional skepticism.

Task interdependence

Task interdependence is the team member's perception of the extent to which their actions and results are affected by the actions and results of the other team members (Johnson & Johnson, 1989). Task interdependence fosters team members' beliefs that the team members are all responsible for achieving the team's goals and stimulates beliefs that collaboration

amongst team members is the foundation of excellent team performance (Ortega, Sánchez-Manzanares, Gil & Rico, 2010). When teams operate virtually, task interdependence fosters a climate in which virtual team members are compelled to increasingly learn collectively, share information frequently, and manage conflict in such a way that they collectively perform better. Subsequently, they also show that when team members perceive their tasks to be performed independently from the rest of the team, interaction and cooperation decline as it is no longer considered valuable, and learning behaviors decrease. In conclusion, previous research suggests that in a virtual setting, task interdependence fosters team learning behaviors (Ortega, Sánchez-Manzanares, Gil & Rico, 2010; Edmondson, 1999; Van den Bossche et al., 2006).

Collective efficacy

Collective efficacy is defined as the extent to which a team believes it can organize and execute the actions necessary to achieve a team's goals (Bandura, 1997). Previous has shown that collective efficacy effectively predicts team effectiveness in both virtual and face-to-face teams (Lent, Schmidt & Schmidt, 2006; Fuller, Hardin & Davison, 2006). Edmondson (1999) shows a positive association between collective efficacy and team learning behaviors. Furthermore, high levels of collective efficacy have also been suggested to foster a team's self-image to overcome the challenges associated with virtual teamwork. This promotes the shared understanding and creates opportunities to share information and learn for team members (González, Burke, Santuzzy & Bradley, 2000).

Collaboration design

Collaboration design is how teams structure processes to collaborate, acquire, exchange, and apply information and ultimately make decisions using this information (Chiravuri, Nazareth, & Ramamurthy, 2011). Collaboration is key to effective teamwork because it provides a means for building an understanding of how the team gets things done (Lin, Chiu, Joe, & Tsai, 2010). However, design cooperation is not an emergent state of being but a construct involving deliberate action. It is shaped by leadership and the organizational culture and climate. In principle, two different collaboration designs have been distinguished: structured and ad-hoc. In a structured collaboration design, teams focus on coordination tasks and have set routines for communication and exchanging information. Teams adopting ad-hoc

collaboration designs have a more fluid way of working, assessing instantly where and when communication moments and needs arise (Cordes, 2016).

Previous research suggests that virtual teams might benefit from structured collaboration designs to maximize learning. Communication technology alone cannot foster collaboration and information sharing without effective communication. Virtual teams that focus on coordinating their actions outperform those focused on the content of the task at hand (Kopp, Hasenbein & Mandl, 2014). Furthermore, the specific nature of virtual teamwork, with reduced information and social cues, creates the need to explore new team learning and training approaches. Teams utilizing a structured collaboration design make better and more effective decisions than teams using an ad hoc collaboration design. Structurally collaborating teams shared more information and equally engaged in critical conflict and co-construction. In this way, these teams had more opportunities to assess persisting individual and group-level biases that could potentially affect the overall decisions (Cordes, 2016). These findings show that a structured collaboration design is particularly relevant in a setting where teams need to make sense of complex and ambiguous information. While structured collaboration teams outperformed ad-hoc collaboration teams, it is essential to note that some of the ad hoc collaboration teams did arrive at the correct solution.

Psychological safety

In virtually operating teams, psychological safety is suggested to reduce the extent to which barriers to virtual interaction, such as temporal and geographical dispersion, reduced social information cues, and cultural differences, are experienced (Ortega, Sánchez-Manzanares, Gil & Rico, 2010). High levels of psychological safety promote more open information sharing, increase the frequency of informal communication, and positively contribute to building trust. These factors contribute to team learning within virtually operating teams (Gibson & Gibbs, 2006; Griffith & Neale, 2001). Furthermore, Schepers, De Jong, Wetzels & De Ruyter (2008) demonstrate that higher levels of psychological safety stimulate the utilization and adoption of information technology. Information technologies play a significant role in facilitating the collaboration and sharing of experiences between team members and are associated with higher team learning behaviors. Furthermore, previous literature indicates that psychological

safety promotes learning-related activities, both in collocated and virtual teams (Griffith & Neale, 2001).

Previous research defined psychological safety as the shared expectation that there are limited social repercussions related to interpersonal risk-taking (Edmondson, 1999; Edmondson & Lei, 2014; Newman, Donohue & Eva, 2017). Team members in psychologically safe teams feel free to share their mistakes, ask critical questions, seek feedback as they expect to be respected and valued despite their openness and self-disclosure of sensitive matters. In turn, teams with low levels of psychological safety stifle their members' willingness to talk about matters important to the team's outcome, limiting the opportunities of teams to learn from each other and negatively affecting the team's performance (Edmondson, 2003). Previous literature has shown that psychological safety is associated with higher team learning behaviors. Teams with high levels of psychological safety promote a climate where learning is considered normal, and innovation and constructive conflict are considered a positive and essential part of delivering high-quality work (West, 2002; Nembhard & Edmondson, 2009).

Based on the papers included, we have developed a tentative model for studying team learning behaviors in the auditing profession, including auditing-specific outcomes affected by virtual teamwork and potential conditions that foster the occurrence of fundamental, intra-, and inter-team learning behaviors. We refer to figure 2 for an overlook of this tentative model.
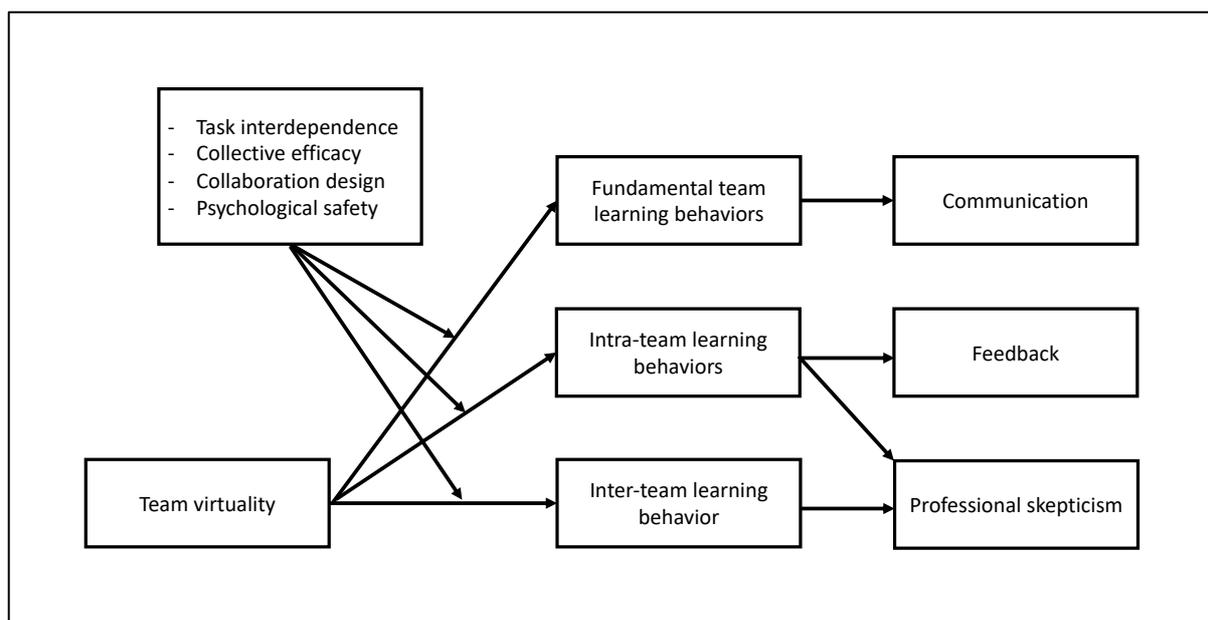
Figure 2: Tentative model based on this review

6. Conclusion and options for future research

The literature selected for this literature review provides us with an overview of what is known about virtual teamwork in dispersed work arrangements in the auditing setting and provides us with crucial insights on drivers and facilitating conditions for team learning behavior in virtual teams.

Based on our analysis, we gained the following vital insights into research regarding virtual teamwork from an auditing-specific context. First, we notice a tradition of researching dispersion and dispersed work arrangements within the auditing profession. The academic interest is mainly directed towards work arrangements that are naturally present within the context of the audit firm, such as international group audits and offshoring and remote auditing (Hunton & Harmon, 2004; Teeter et al., 2010; Hanes, 2013; Sunderland & Trompeter, 2017). These remote working arrangements do not fully reflect the definition of virtual teamwork underlying this review at a conceptual level. Remote working arrangements such as offshoring and international group audits involve dispersion and information technology to facilitate communication (Hunton & Harmon, 2004; Teeter et al., 2010; Hanes, 2013). The work in these settings is done relatively independently. International group audits involve collaboration between different teams, but the teams of the components operate separately

from the principal auditor, but the core engagement team operates collocated (Sunderland & Trompeter, 2017). A similar situation occurs in offshoring. Audit firms and engagement teams outsource specific activities to a subsidiary in a low-cost country that takes care of well-defined, somewhat routine tasks with relatively low interdependence and interconnectedness to the core engagement team (Downey, 2018).

The dispersion present in these work arrangements does not automatically imply the occurrence of virtual teamwork. Considering that the remote settings in auditing do not fully reflect virtual teamwork might explain why none of the studies for the first part of this review included a measure of team virtuality to assess the impact of remote work. Although dispersion and team virtuality are related, the concept of team virtuality reflects the extent to which a team can be considered virtual due to its dispersion. Team virtuality includes concepts such as communication frequency and information richness to assess to what extent teams experience potential downsides of virtual teamwork (Handke et al., 2020). Teams that face high degrees of dispersion might not, or only limitedly, experience problems due to virtual teamwork. They communicate frequently using communications means rich in social information (Costa, Handke & O'neil, 2020). Previous research in a dispersed auditing setting provides limited evidence on how virtual teamwork occurs within the auditing profession. Therefore, the insights might be limited in their generalizability about how remote auditing is currently implemented within the audit profession (Eulerich, Wagener, Wood, 2021).

Second, the literature included in this review has studied concepts such as feedback (Andiola, 2014: Andiola, Downey, Noga, 2018), communication (Downey et al., 2020; Downey & Bedard, 2019), and professional skepticism (Kuselias, Agoglia & Wang, 2017; Bennett & Hatfield, 2013; Saiewitz & Kida, 2018), which might be affected by dispersion in the auditing profession. The included papers tend to study these concepts as outcomes relevant to the auditing profession that dispersion might affect. These papers tend to focus on the outcomes rather than the mechanism behind the outcomes and provide us with limited insight on actionable and manipulative behaviors to ensure these outcomes. Our analysis shows that dispersion affects the outcomes of interest by the auditing profession through the effect dispersion has on the underlying team learning behaviors. Academics and auditing regulators have expressed and emphasized the importance of team learning to the auditing profession

(MCA,2020: Wiese et al., 2020; Edmondson & Lei, 2014). Team learning behaviors are associated with a broader set of outcomes relevant to the auditing profession than just communication, feedback, and professional skepticism, such as increased shared mental representations, team decision quality, and team performance (Wiese et al., 2020). By focusing on these more outcome-related concepts, the effect of dispersion on the auditing profession might not adequately reflect the current literature. Since virtual teamwork has widely adapted in the auditing profession and team learning is considered a prime driver of high-quality judgments, understanding team learning becomes crucial for audit firms.

Third, the papers selected predominantly studied the phenomenon of dispersion at the individual level (Andiola, 2014: Andiola, Downey, Noga, 2018; Bennett & Hatfield, 2013; Saiewitz & Kida, 2018; Eulerich, Wagener, Wood, 2021; Sunderland & Trompeter, 2017; Hunton & Harmon, 2004; Teeter et al., 2010; Hanes, 2013). The emphasis on the individual level does overlook the fact that auditing is a profession in which teamwork is the prime unit of working (Detzen & Gold, 2019). Previous literature has provided little evidence on team-level behaviors and dynamics from a remote auditing setting (Downey et al., 2020). This warrants further investigation of inputs, processes, and outcomes related to virtual teamwork in the auditing profession at the team level, as overlooking team-level behaviors ignore that the team is the prime unit of work in the auditing profession. This limits practitioners, regulators, and academics' understanding of the drivers of team behaviors necessary to deliver the high-quality decisions required of auditors.

Fourth, previous literature has studied dispersion in the auditing setting using two different methods. On the one hand, previous literature has studied dispersion using experimental tasks with professionals that mimic the natural work environment, such as going concern opinion decisions (Andiola, 2014; Andiola, Downey, Spilker, Noga, 2018; Bennett & Hatfield, 2013; Saiewitz & Kida, 2018; Sorensen & Ortegren, 2020; Kuselias, Agoglia, Wang, 2017). On the other hand, previous literature has conceptually studied dispersion with the intention of theory development and frameworks for future research (Teeter et al., 2010; Hanes, 2013; Hunton & Harmon, 2004; Sunderland & Trompeter, 2017). The currently available literature provides only little additional qualitative or quantitative (Downey et al., 2020; Downey & Bedard, 2019) evidence concerning dispersed work arrangements or virtual teamwork in the

auditing profession that uses evidence from natural work teams that perform tasks relevant to the organization. This limits the generalizability of the previous literature to how virtual teams are currently employed within the auditing profession.

Fifth, the literature included for the first part of this study has conceptualized dispersion almost exclusively in a dichotomous way, comparing face-to-face operating respondents with remote or dispersed operating respondents (Andiola, 2014; Andiola, Downey, Spilker, Noga, 2018; Bennett & Hatfield, 2013; Saiewitz & Kida, 2018; Sorensen & Ortegren, 2020; Kuselias, Agoglia, Wang, 2017; Teeter et al., 2010; Hanes, 2013; Hunton & Harmon, 2004; Sunderland & Trompeter, 2017). Although experimental methods might partly drive the prevalence of a dichotomous operationalization, it overlooks the dimensional nature of team virtuality. It limits the generalizability of results to other settings and the current way of working in auditing. A dimensional conceptualization of dispersion (as in Downey et al. 2020) suits the natural working arrangements present in natural auditing teams better and provides us with insights necessary as we progress towards an increasingly hybrid operating auditing profession (Eulerich, Wagener & Wood, 2021; Sorensen & Ortegren, 2020;).

Based on the papers selected for the second part of this literature review, we gained insights into the drivers and inhibitors of team learning behaviors within virtual teams. First and foremost, based on the literature included in the review, team virtuality can be seen as a prominent inhibitor of team learning behaviors in virtual teams (Allmendinger, 2010; Cordes, 2016; Schultze & Brooks, 2019; Nilsen, 2010; Lundin Magnusson, 2003; Janssen & Bodemer, 201). Although team virtuality has been conceptualized as dichotomous, dimensional, or as the setting in which teamwork occurs, our results indicate that a dimensional conceptualization has established itself as the dominant way of operationalizing team virtuality (Handke et al., 2020; Costa et al., 2021). The papers included in this review have identified psychological safety, task interdependence, collective efficacy, and collaboration structure design as conditions that facilitate fundamental, intra-, and inter-team learning behaviors within virtual teams. Our review synthesized findings from various streams of literature and settings, such as education, health care, and project teams operating in a competitive business environment, and have provided a first attempt at uncovering a more

coherent and complete overlook about how team learning behaviors occur within virtually operating teams.

Contrasting these findings on team learning behavior in virtual teams with the insight we have gained from research on dispersion in the auditing profession, we can conclude several things concerning the state of virtual teamwork research within the auditing profession. First, an accurate assessment of virtual teamwork within auditing is possible now as the core of the auditing work is now performed remotely. Engagement teams working remotely to respond to the COVID-19 pandemic fulfill the three requirements of dispersion, reliance on information technology, and existence as a team. They can therefore be considered a real example of a virtual team. Second, any assessment of the impact of virtual teamwork on the auditing profession should be done using a dimensional operationalization of team virtuality. The predominantly employed dichotomous operationalization of virtuality in auditing does not reflect how team virtuality is understood and conceptualized in the broader virtual team research and limits the generalizability of results from auditing to other domains. In addition, a dichotomous operationalization also overlooks how virtual teamwork is currently implemented in the auditing profession (Eulerich, Wagener & Wood, 2021). Third, the focus should be on understanding the mechanism underlying the impact of team virtuality on fundamental, intra-, and inter-team learning behaviors and not solely the outcomes associated with these behaviors. Professional skepticism, feedback, and communication are essential concepts for the auditing profession, and are affected by the increased implementation of virtual teamwork within the auditing profession. Understanding how virtual teamwork affects outcomes in the auditing profession is tantamount. Fundamental, intra-, and inter-team learning behaviors are an excellent framework to assess the impact virtual teamwork has on virtually operating engagement teams. It is proven a mediating mechanism between team virtuality and outcomes that is important to the auditing profession. Emphasis should be placed on intra-team learning behaviors, as previous literature has identified the behaviors to uniquely predict the occurrence of team learning behaviors (Wiese et al., 2020). In addition to fundamental, intra-, and inter-team learning behaviors as a framework for assessing the impact of virtual teamwork on the auditing profession, the second part of this review identifies concepts that facilitate team learning on the team level. Psychological safety, collective efficacy, interdependence, and collaboration

design set the stage for team learning behaviors in virtually operating engagement teams to occur and should therefore be included when studying the impact virtual teamwork has on virtual engagement teams.

By taking the implications of this study into account, future research on virtually operating engagement teams would maximize the added benefit to both practitioners and academics. First, any empirical evidence from natural work teams operating virtually would enrich the research on virtual teams. The evidence concerning learning behaviors in virtual natural work teams is limited and would greatly supplement the available evidence from experimental settings and student teams (Wiese et al., 2020). Second, standardization of conceptualizations and theoretical frameworks between virtual teamwork research in auditing and virtual teamwork research at large would allow academics to gather evidence in a natural setting that is characterized by high levels of professionalism, hierarchical structures in which complex decisions need to be made with ambiguous information. The characteristics of the auditing setting would further enhance the presently available insights about team learning behaviors in teams of professionals working for professional service firms. Third, audit practitioners will benefit from empirically validated insight leveraging the strategic advantages of virtual teamwork successfully and how to mitigate threats due to virtual teamwork to deliver high-quality audits by studying variables that vary over time and are malleable by auditors. This sheds further light on how the virtual nature of an engagement team interacts with other social and structural characteristics of a team and thus creates variation in virtual engagement team's effectiveness. Overall, virtual teamwork research in the auditing profession that adheres to conceptualizations reflected in the broader virtual team literature would provide practitioners with valuable insights on how to work, learn and deliver high-quality engagements virtually.

Based on the tentative model derived from our analysis, we developed a list of potential questions for further research in table 4. As mentioned before, future empirical research on virtual teamwork within the auditing profession should meet specific requirements. Further investigations on team learning behavior within virtually operating engagement teams should be done with conceptualizations that reflect the current working arrangements within the audit profession, such as a dimensional operationalization of team virtuality. Furthermore,

future research should focus on the team level as the team is the prime unit of work and learning within the auditing profession. Studying team learning behaviors in virtually operating engagement teams will contribute to the audit literature and auditing profession, and the virtual teamwork literature as evidence on the team learning behaviors in natural work teams is still scant (Wiese et al., 2021).

Previous research on team learning behaviors provides us with a list of factors that can be examined in a virtual environment. For example, Koeslag-Kreunen et al. (2018) indicate that leadership plays a prominent role in promoting team learning behaviors; however, the potential prominent role of leadership on propagating team learning behaviors in virtual teams has only been suggested and not empirically verified. Considering that literature on team learning behaviors in virtual teams is still in development, the current state of literature warrants both a qualitative approach using interview data and a quantitative approach combining survey and archival data gathered from natural work teams, preferably in a longitudinal manner. While prior research in an auditing context predominantly involved experimental research design or theory development, we see great potential in a mixed-method approach for studying team learning behaviors within engagement teams. The Foundation for Auditing Research offers in this regard a unique opportunity to establish and maintain relationships with audit firms in the Netherlands. Audit firms can be a valuable partner in facilitating the research we propose by allowing access to their privately held information and their employees as respondents. Firms would be more than just partners in data collection, but they would be partners in ensuring the research at hand is relevant and can genuinely assist in ensuring effective virtual teams that provide the level of quality and service that is expected from them.

Table 4: Research questions for future research

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1   To what extent does team virtuality affect the fundamental, intra-, and inter-team learning behaviors of an engagement team?

2   To what extent do conditions such as task interdependence, collective efficacy, collaboration design, and psychological safety affect team learning behaviors in engagement teams?

3   What is the impact of team virtuality on the performance of an engagement team?

4   What other audit-related outcomes are affected by the implementation of virtual teamwork within the auditing profession?

5   Which leadership behaviors are effective at overcoming the challenges associated with virtual teamwork in auditing?

6   What mitigation mechanisms are used within the auditing profession to overcome the challenges associated with virtual teamwork?

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7. References

*References included in the literature review are marked with an asterisk.

*Allmendinger, K. (2010). Social presence in synchronous virtual learning situations: The role of nonverbal signals displayed by avatars. *Educational Psychology Review*, 22(1), 41-56.

American Institute of Certified Public Accountants (AICPA). (2010). *Due professional care in the performance of work (AU Section 230)*. New York, NY: American Institute of Certified Public Accountants (AICPA), New York, NY.

American Institute of Certified Public Accountants (AICPA). (2013). *Audit evidence. (AU Section 326)*. American Institute of Certified Public Accountants (AICPA), New York, NY.

Ancona, D., & Caldwell, D. (1992). Bridging the boundary: External activity and performance in organizational teams. *Administrative science quarterly*, 634-665.

Andiola, L. M. (2014). Performance feedback in the audit environment: A review and synthesis of research on the behavioral effects. *Journal of Accounting Literature*, *33*(1-2), 1-36.

Andiola, L.M., Brazel, J.F., Downey, D., & Schaefer, T. (2020). Coaching Today's Auditors: What Causes Reviewers to Adopt a more Developmental Approach. Available at SSRN: https://ssrn.com/abstract=3244759 or http://dx.doi.org/10.2139/ssrn.3244759.

*Andiola, L. M., Downey, D. H., Spilker, B. C., & Noga, T. J. (2018). An examination of the interactive effect of feedback source and sign in the offshoring environment: A social identity perspective. *Behavioral Research in Accounting*, 30(2), 1-21.

* Andres, H. P. (2012). Technology-mediated collaboration, shared mental model and task performance. *Journal of Organizational and End User Computing (JOEUC)*, 24(1), 64-81.

*Andres, H. & Shipps, B. (2010). Team Learning in Technology-Mediated Distributed Teams. *Journal of Information Systems Education*, Vol. 21(2).

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York: Freeman.

*Barrett, M., Cooper, D. J., & Jamal, K. (2005). Globalization and the coordinating of work in multinational audits. *Accounting, Organizations and Society*, *30*(1), 1-24.

Bell, B. S., & Kozlowski, S. W. (2002). A typology of virtual teams: Implications for effective leadership. *Group & organization management*, 27(1), 14-49.

*Bennett, G. B., & Hatfield, R. C. (2018). Staff auditors' proclivity for computer-mediated communication with clients and its effect on skeptical behavior. *Accounting, Organizations and Society*, *68*, 42-57.

*Brazel, J., Agoglia, P. & Hatfield, R. (2004). Electronic versus Face-to-Face Review: The Effects of Alternative Forms of Review on Auditors' Performance. *The Accounting Review* 79 (4): 949–966.

Bresman, H. (2010). External learning activities and team performance: A multimethod field study. *Organization Scienc*e, 21(1), 81-96.

Chen, Q., Kelly, K., & Salterio, S. E. (2012). Do changes in audit actions and attitudes consistent with increased auditor skepticism deter aggressive earnings management? An experimental investigation. *Accounting, Organizations and Society*, 37(2), 95-115.

Chidambaram, L., & Tung, L. L. (2005). Is out of sight, out of mind? An empirical study of social loafing in technology-supported groups. *Information systems research*, 16(2), 149-168.

Chiravuri, A., Nazareth, D., & Ramamurthy, K. (2011). Cognitive conflict and consensus generation in virtual teams during knowledge capture: Comparative effectiveness of techniques. *Journal of Management Information Systems*, 28(1), 311–350.

Christie, B. (1974). Semantic differential judgments of communications media and other concepts: 1. Differences between the media. *Communications studies group*. (Article No. E/74120/CR).

*Cordes, S. (2016). Virtual team learning: The role of collaboration process and technology affordance in team decision making. *Knowledge Management & E-Learning*, 8(4), 602–627.

Costa P.L., Handke, L., O'Neill T. (2021) Are All Lockdown Teams Created Equally? Work Characteristics and Team Perceived Virtuality. *Small Group Research*, 52(5), 600-628.

Cramton, C. D., & Orvis, K. L. (2003). Overcoming barriers to information sharing in virtual teams. *Virtual teams that work: Creating conditions for virtual team effectiveness,* 214-230.

Day, D. V., Gronn, P., & Salas, E. (2004). Leadership capacity in teams. *Leadership Quarterly,* 15, 857-880.

DeChurch, L. A., & Mesmer-Magnus, J. R. (2010). The cognitive underpinnings of effective teamwork: A meta-analysis. *Journal of Applied Psychology*, 951, 32-53.

Decuyper, S., Dochy, F., & Van den Bossche, P. (2010). Grasping the dynamic complexity of team learning: An integrative model for effective team learning in organisations. *Educational Research Review,* 52, 111-133.

DeLuca, D. and Valacich, J.S. (2006), "Virtual teams in and out of synchronicity", *Information Technology & People*, Vol. 19 No. 4, pp. 323-344.

Dennis, A. R., Fuller, R. M., & Valacich, J. S. (2008). Media, tasks, and communication processes: A theory of media synchronicity. *MIS quarterly*, 575-600.

Detzen, D. & Gold, A. (2019). *A Review of the Academic Literature of the Different Shades of Audit Quality*. Report commissioned by the Commissie Toekomst Accountancysector.

*De Jong, B. A., Dirks, K. T., & Gillespie, N. (2016). Trust and team performance: A meta-analysis of main effects, moderators, and covariates. *Journal of applied psychology*, *101*(8), 1134.

De Wit, F. R., Greer, L. L., & Jehn, K. A. (2012). The paradox of intragroup conflict: A meta-analysis. *Journal of Applied Psychology*, 972, 360-390.

DiNapoli, J. (2021, October 1st). *PwC offers U.S. employees full-time remote work.* Reuters.com. https://libraryguides.vu.edu.au/apa-referencing/7Webpages.

*Dixon, N. (2017). Learning together and working apart: routines for organizational learning in virtual teams. *The Learning Organization*, 24(3).

Downey, D. H. (2018). An exploration of offshoring in audit practice and the potential consequences of associated work "redesign" on auditor performance. *Auditing: A Journal of Practice & Theory*, 37(2), 197-223.

*Downey, D. H., & Bedard, J. C. (2019). Coordination and communication challenges in global group audits. *Auditing: A Journal of Practice & Theory*, *38*(1), 123-147.

*Downey, D., Obermire, K., Zehms, K. (2020). Toward an Understanding of Audit Team Distribution and Performance Quality. *AUDITING: A Journal of Practice & Theory*, 39 (4): 87–112.

Drach-Zahavy, A., & Somech, A. (2001). Understanding team innovation: The role of team processes and structures. *Group Dynamics: Theory, Research, and Practice*, 52, 111-123.

Dulebohn, J. H., & Hoch, J. E. (2017). Virtual teams in organizations. *Human Resource Management Review,* 27(4), 569-574.

Duh, R. R., Knechel, W. R., & Lin, C. C. (2020). The Effects of Audit Firms' Knowledge Sharing on Audit Quality and Efficiency. *Auditing: A Journal of Practice & Theory*, *39*(2), 51-79.

Durocher, S., Bujaki, M. & Brouard, F. (2016), Attracting Millennials: Legitimacy management and bottom-up socialization processes within accounting firms. *Critical Perspectives   on Accounting*, 39, 1-24.

Edmondson, A. (1999). Psychological safety and learning behavior in work teams. *Administrative science quarterly*, 442, 350-383.

Edmondson, A. C. (2003). Speaking up in the operating room: How team leaders promote learning in interdisciplinary action teams. *Journal of Management Studies*, 40, 1419-1452.

Edmondson, A. C., Dillon, J. R., & Roloff, K. S. (2007). Three perspectives on team learning: outcome improvement, task Mastery, and group process. *The Academy of Management Annals*, 1, 269-314.

Edmondson, A. C., & Lei, Z. (2014). Psychological safety: The history, renaissance, and future of an interpersonal construct. *Annual Review Organizational Psycholology and Organizational Behavior*, *1*(1), 23-43.

Edmondson, A. C., & Nembhard, I. M. (2009). Product development and learning in project teams: The challenges are the benefits. *Journal of Product Innovation Management*, 262, 123-138.

Ellis, A. P. J., Hollenbeck, J. R., Ilgen, D. R., Porter, C. O. L. H., West, B. J., & Moon, H. (2003). Team Learning: Collectively Connecting the Dots. *Journal of Applied Psychology*, 88(5), 821-835.

*Eulerich, M., Wagener, M. & Wood, D. (January 27, 2021). Evidence on Internal Audit Effectiveness from Transitioning to Remote Audits Because of COVID-19. *Available at SSRN: https://ssrn.com/abstract=3774050*

Ferris, S. P., & Godar, S. H. (Eds.). (2005). *Teaching and learning with virtual teams. IGI Global.*

Fuller, M. A., Hardin, A. M., & Davison, R. M. (2006). Efficacy in technology-mediated distributed teams. *Journal of Management Information Systems,* 23(3), 209-235.

Gibbins, M., Salterio, S. & Webb, A. (2001). Evidence about Auditor-Client Management Negotiations Concerning Client's Financial Responsibility. *Journal of Accounting Research*, 39(3).

Gibbins, M., & Trotman, K. T. (2002). Audit review: Managers' interpersonal expectations and conduct of the review. *Contemporary Accounting Research*, *19*(3), 411-444.

Gibson, C. B., & Gibbs, J. L. (2006). Unpacking the concept of virtuality: The effects of geographic dispersion, electronic dependence, dynamic structure, and national diversity on team innovation. *Administrative science quarterly*, *51*(3), 451-495.

Gilson, L. L., Maynard, M. T., Jones Young, N. C., Vartiainen, M., & Hakonen, M. (2015). Virtual teams research: 10 years, 10 themes, and 10 opportunities. *Journal of Management*, 41.

Gluesing, J. C., Alcordo, T., Baba, M. L., Britt, D., Wagner, K. H., McKether, W., & Riopelle, K. (2003). The development of global virtual teams. *Virtual teams that work: Creating conditions for virtual team effectiveness*, 353-380.

Gold, A., Knechel, W. R., & Wallage, P. (2012). The effect of the strictness of consultation requirements on fraud consultation. *The Accounting Review*, *87*(3), 925-949.

González, M. G., Burke, M. J., Santuzzi, A. M., & Bradley, J. C. (2003). The impact of group process variables on the effectiveness of distance collaboration groups. *Computers in Human Behavior*, *19*(5), 629-648.

Greer, L., de Jong, B., Schouten, M & Dannals, J. (2018). Why and when hierarchy impacts team effectiveness: A meta-analytic integration. *Journal of Applied Psychology*, 103(6), 591.

Griffith, T. L., & Neale, M. A. (2001). 8. Information processing in traditional, hybrid, and virtual teams: From nascent knowledge to transactive memory. *Research in organizational behavior*, *23*, 379-421.

Hacker, J. V., Johnson, M., Saunders, C., & Thayer, A. L. (2019). Trust in Virtual Teams: A Multidisciplinary Review and Integration. *Australasian Journal of Information Systems*, 23.

Handke, L., Klonek, F. E., Parker, S. K., & Kauffeld, S. (2020). Interactive effects of team virtuality and work design on team functioning. *Small Group Research*, 51(1), 3-47.

*Häkkinen, P. (2004). What makes learning and understanding in virtual teams so difficult? *CyberPsychology & behavior*, 7(2), 201-206.

*Hanes, D. (2013). Geographically distributed audit work: Theoretical considerations and future directions. *Journal of Accounting Literature*, 32 (1), Pages 1-29.

Hertel, G., Geister, S. & Konradt, U. (2005). Managing virtual teams: a review of current empirical research. *Human Resource Management Review*, 15, 69-95.

Hinds, P. J., & Mortensen, M. (2005). Understanding conflict in geographically distributed teams: The moderating effects of shared identity, shared context, and spontaneous communication. *Organization science*, *16*(3), 290-307.

Hoch, J. E., & Kozlowski, S. W. J. (2014). Leading virtual teams: Hierarchical leadership, structural supports, and shared team leadership. *Journal of Applied Psychology*, 99(3), 390–403.

*Hunton, J. E., & Harmon, W. K. (2004). A model for investigating telework in accounting. *International Journal of Accounting Information Systems*, 5(4), 417-427.

International Auditing and Assurance Standards Board (IAASB). 2015. Agenda Item 2-C - Invitation to Comment: Enhancing Audit Quality in the Public Interest -A Focus on Quality Control, Group Audits and Professional Skepticism (12/17/2015).

*Janssen, J., & Bodemer, D. (2013). Coordinated computer-supported collaborative learning: Awareness and awareness tools. *Educational Psychologist*, *48*(1), 40-55.

Johnson, D. W., Johnson, R. T., & Stanne, M. B. (1989). Impact of goal and resource interdependence on problem-solving success. *The Journal of Social Psychology*, *129*(5), 621-629.

Joshi, A., Pandey, N. & Han, G. (2009). Bracketing team boundary spanning: An examination of task-based, team-level, and contextual antecedents. *Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior*, 30(6), 731-759.

*Kerr, D. S., & Murthy, U. S. (1994). Group decision support system and cooperative learning in auditing: An experimental investigation. *Journal of Information Systems*, *8*(2), 85-96.

Kirkman, B. L., Rosen, B., Tesluk, P. E., & Gibson, C. B. (2004). The impact of team empowerment on virtual team performance: The moderating role of face-to-face interaction. *Academy of Management Journal*, 47, 175-192.

*Kirschner, P. A., & Van Bruggen, J. (2004). Learning and understanding in virtual teams. *CyberPsychology & Behavior*, 7(2), 135-139.

Knechel, W., Naiker, V. & Pacheco, G. (2007). Does Auditor Industry Specialization Matter? Evidence from Market Reaction to Auditor Switches. *AUDITING: A Journal of Practice & Theory,* 26(1), 19-45.

Kock, N. (2005). Media richness or media naturalness? The evolution of our biological communication apparatus and its influence on our behavior toward e-communication tools. *IEEE Transactions on Professional Communication*, 48(2).

Koeslag-Kreunen, M., Van den Bossche, P., Hoven, M., Van der Klink, M., & Gijselaers, W. (2018). When leadership powers team learning: A meta-analysis. *Small Group Research*, 49(4), 475-513.

Kopp, B., Hasenbein, M., & Mandl, H. (2014). Case-based learning in virtual groups– collaborative problem solving activities and learning outcomes in a virtual professional training course. *Interactive Learning Environments*, 22(3), 351-372.

Kozlowski, S. W. J., & Bell, B. S. (2008). Team learning, development, and adaptation. In V. I. Sessa & M. London (Eds.), *Work group learning: Understanding, im- proving and assessing how groups learn in organizations* (pp. 15-44). New York, NY: Taylor & Francis Group/Lawrence Erlbaum Associates.

Kozlowski, S. W. J., & Ilgen, D. R. (2006). Enhancing the effectiveness of work groups and teams. *Psychological Science in the Public Interest*, 7, 77-124.

Kraut, R. E., & Streeter, L. A. (1995). Coordination in software development. *Communications of the ACM*, *38*(3), 69-82.

*Kuselias, S., Agoglia, C. P., & Wang, E. (2017). Can Distributed Teams Reduce Audit Staff Reliance on a Supervisor's Client-Favorable Preferences?. *Available at SSRN 3072365*.

Lee, C. C., & Welker, R. B. (2007). The effect of audit inquiries on the ability to detect financial misrepresentations. *Behavioral Research in Accounting*, *19*(1), 161-178.

Lent, R. W., Schmidt, J., & Schmidt, L. (2006). Collective efficacy beliefs in student work teams: Relation to self-efficacy, cohesion, and performance. *Journal of Vocational Behavior*, *68*(1), 73-84.

Lewis, K., Lange, D., & Gillis, L. (2005). Transactive memory systems, learning, and learning transfer. *Organization Science*, 16, 581-598.

Lin, C.-P., Chiu, C.-K., Joe, S.-W., & Tsai, Y.-H. (2010). Assessing online learning ability from a social exchange perspective: A survey of virtual teams within business organizations. *International Journal of Human-Computer Interaction*, 26(9), 849–867.

*Lundin, J., & Magnusson, M. (2003). Collaborative learning in mobile work. *Journal of Computer Assisted Learning*, *19*(3), 273-283.

Marks, M. A., Mathieu, J. E., & Zaccaro, S. J. (2001). A temporally based framework and taxonomy of team processes. *Academy of management review*, 26(3), 356-376.

Marlow, S. L., Lacerenza, C. N., Paoletti, J., Burke, C. S., & Salas, E. (2018). Does team communication represent a one-size-fits-all approach?: A meta-analysis of team communication and performance. *Organizational Behavior and Human Decision Processes*, 144, 145–170.

Matveev, A. V., & Milter, R. G. (2004). The value of intercultural competence for performance of multicultural teams. *Team Performance Management: An International Journal*, 10 (5/6), 104-111.

Marrone, J. A., Tesluk, P. E., & Carson, J. B. (2007). A multilevel investigation of antecedents and consequences of team member boundary-spanning behavior. *Academy of Management Journal,* 50, 1423-1439.

Mathieu, J., Maynard, M. T., Rapp, T., & Gilson, L. (2008). Team effectiveness 1997-2007: A review of recent advancements and a glimpse into the future. *Journal of managem*ent, 34(3), 410-476.

Maznevski, M. L., & Athanassiou, N. A. (2003). Designing the knowledge-management infrastructure for virtual teams: Building and using social networks and social capital. *Virtual teams that work: Creating conditions for virtual team effectiveness,* 196-213

Mesmer-Magnus, J. R., & DeChurch, L. A. (2009). Information sharing and team performance: A meta-analysis. *Journal of Applied Psychology*, 94(2), 535-546.

Michael, D. N. (1973). *On learning to plan and planning to learn: The social psychology of changing toward future responsive societal learning.* San Francisco: Jossey-Bass.

Miranda, S. M., & Saunders, C. S. (2003). The social construction of meaning: An alternative perspective on information sharing. *Information systems research*, 14(1), 87-106.

Monitoring Commissie Accountancy (2020). *Spiegel voor de accountancy*. Available via: http://www.monitoringaccountancy.nl/wp-content/uploads/2020/01/Eindrapport-Monitoring-Commissie-Accountancy-140120.pdf

Nellen L., Gijselaers W. & Grohnert T. (2020). A Meta-Analytic Literature Review on Organization-Level Drivers of Team Learning. *Human Resource Development Review*, 19(2), 152-182.

Nelson, M. W. (2009). A model and literature review of professional skepticism in auditing. *AUDITING: A JOURNAL OF PRACTICE & THEORY*, *28*(2), 1.

Newman, A., Donohue, R., & Eva, N. (2017). Psychological safety: A systematic review of the literature. *Human Resource Management Review*, *27*(3), 521-535.

*Nilsen, L.L. (2011). Collaboration and learning in medical teams by using video conference. *Behaviour & Information Technology*, 30:4, 507-515

Oertel, R. & Antoni, C. (2015). Phase-specific relationships between team learning processes and transactive memory development. *European Journal of Work and Organizational Psychology*, 24, 726-741.

*Ortega, Sánchez-Manzanares, Gil & Rico (2010). Team Learning and Effectiveness in Virtual Project Teams: The Role of Beliefs about Interpersonal Context. *The Spanish Journal of Psychology,* 13 (1), 267-276.

Peecher, M. E. (1996). The influence of auditors' justification processes on their decisions: A cognitive model and experimental evidence. *Journal of Accounting Research*, *34*(1), 125-140.

Peecher, M. E., Piercey, M. D., Rich, J. S., & Tubbs, R. M. (2010). The effects of a supervisor's active intervention in subordinates' judgments, directional goals, and perceived technical knowledge advantage on audit team judgments. *The Accounting Review*, 85(5), 1763-1786.

Peecher, M. E., Solomon, I., & Trotman, K. T. (2013). An accountability framework for financial statement auditors and related research questions. *Accounting, Organizations and Society*, *38*(8), 596-620.

*Peñarroja, V., Orengo, V., Zornoza, A., Sánchez, J., & Ripoll, P. (2015). How team feedback and team trust influence information processing and learning in virtual teams: A moderated mediation model. *Computers in Human Behavior*, 48, 9-16.

Piccoli, G., Powell, A., & Ives, B. (2004). Virtual teams: team control structure, work processes, and team effectiveness. *Information Technology & People*. 17(4), 359-379.

Public Company Accounting Oversight Board (PCAOB). (2010). *Auditing standard no. 13: The auditors' responses to the risks of material misstatement*. PCAOB, Washington, DC.

Public Company Accounting Oversight Board (PCAOB). (2016). *Order instituting disciplinary proceedings, making findings, and imposing sanctions in the matter of Michael F. Albanese, CPA and Michael F. Albanese, CPA (PCAOB Release No. 105-2016-018)*. PCAOB, Washington, DC.

Raghuram, S., Hill, S., Gibbs, J. & Maruping, L. (2019). Virtual Work: Bridging Research Clusters. *Academy of management Annals,* 13, 308–341.

Ren, Y. (2018). *Learning in virtual teams*. In L. Argote & J. M. Levine (Eds.) The oxford handbook of group and organizational learning. New York, NY: Oxford University Press.

Rich, J. S., Solomon, I., & Trotman, K. T. (1997). Multi-auditor judgment/decision making research: A decade later. *Journal of Accounting Literature*, *16*, 86.

Saiewitz, A., & Kida, T. (2018). The effects of an auditor's communication mode and professional tone on client responses to audit inquiries. *Accounting, Organizations and Society*, *65*, 33-43.

Salas, E., Cannon-Bowers, J. A., & Johnston, J. H. (1997). *How can you turn a team of experts into an expert team?: Emerging training strategies.* In C. E. Zsambok & G. Klein (Eds.), Expertise: Research and applications. Naturalistic decision making (pp. 359–370). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

*Saunders, K. K. (2015). Examining the Impact of Offshoring and Level of Preparer Judgment on the Audit Review Process. (Doctoral dissertation). Retrieved from https://scholarcommons.sc.edu/etd/3670

Saunders, C. S., & Ahuja, M. K. (2006). Are all distributed teams the same? Differentiating between temporary and ongoing distributed teams. *Small Group Research*, *37*(6), 662-700.

Savelsbergh, C., van der Heijden, B. & Poell, R. (2009). The development and empirical validation of a multidimensional measurement instrument for team learning behaviors. *Small Group Research,* 40, 578-607.

Schepers, J., de Jong, A., Wetzels, M., & de Ruyter, K. (2008). Psychological safety and social support in groupware adoption: A multi-level assessment in education. *Computers & Education*, *51*(2), 757-775.

Schein, E. (1993). How can organizations learn faster?: The problem of entering the Green Room. *Sloan Management Review,* 34, 85- 92.

Senge, P. (1990). *The fifth discipline: The art and practice of the learning organization*. New York: Doubleday/Currency.

Sessa, V., London, M. (2008). Group learning: An introduction. In Sessa, V., London, M. (Eds.), *Work group learning. Understanding, improving and assessing how groups learn in organizations* (pp. 1-14). Mahwah, NJ: Lawrence Erlbaum.

*Schultze, U., & Brooks, J. A. M. (2019). An interactional view of social presence: making the virtual other "real". *Information Systems Journal*, 29(3), 707-737.

Sharma, M., & Ghosh, A. (2007). Does team size matter? A study of the impact of team size on the transactive memory system and performance of I.T. sector teams. *South Asian Journal of Management,* 14, 96-115.

*Shi, W., & Weber, M. S. (2018). Rethinking the complexity of virtual work and knowledge sharing. *Journal of the Association for Information Science and Technology*, 69(11), 1318-1329.

Shuffler, M. L., Wiese, C. W., Salas, E., & Burke, C. S. (2010). Leading one another across time and space: Exploring shared leadership functions in virtual teams. *Revista de Psicolog´ıa del Trabajo y de las Organizaciones,* 26, 3-17.

Sitkin, Sim B. (1992). *Learning through failure: The strategy of small losses.* In L. L. Cummings & B. M. Staw (Eds.), Research in Organizational Behavior (pp. 231-266). Greenwich, CT: JAI Press.

Sorensen, K., & Ortegren, M. (2021). The next best thing: Social presence and accountability's impact on auditor professional skepticism. *Journal of Corporate Accounting & Finance*, *32*(2), 39-51.

Srikanth, K., & Puranam, P. (2011). Integrating distributed work: comparing task design, communication, and tacit coordination mechanisms. *Strategic management journal*, *32*(8), 849-875.

*Staples, D. S., & Webster, J. (2008). Exploring the effects of trust, task interdependence and virtualness on knowledge sharing in teams. *Information systems journal*, *18*(6), 617-640.

*Sunderland, D., & Trompeter, G. M. (2017). Multinational group audits: Problems faced in practice and opportunities for research. *Auditing: A Journal of Practice & Theory*, 36(3), 159-183.

Tannenbaum, S. I., Mathieu, J. E., Salas, E., & Cohen, D. (2012). Teams are changing: Are research and practice evolving fast enough? *Industrial and Organizational Psychology*, 5, 2-24.

*Teeter, R., Alles, M., Vasarhelyi, M. (2014). The Remote Audit. *Journal of Emerging Technologies in Accounting,* 7, 73-88.

Townsend, A., DeMarie, S., & Hendrickson, A. (1998) Virtual teams: Technology and the workplace of the future. *Academy of Management Perspectives*, 12(3).

Trotman, K., Bauer, T. & Humphreys, K. (2015). Group judgment and decision making in auditing: Past and future research. *Accounting, Organizations and Society,* 47, 56-72.

Van den Bossche, P., Gijselaers, W. H., Segers, M. S. R., Kirschner, P. A. (2006). Social and cognitive factors driving teamwork in collaborative learning environments. *Small Group Research,* 37(5), 490–521.

Van den Bossche, P., & Nijs, G. (2021). Team Learning: Harvesting Diversity. *In Theories of Workplace Learning in Changing Times* (pp. 155-172). Routledge.

Van der Vegt, G. S., Emans, B. J., & Van De Vliert, E. (2001). Patterns of interdependence in work teams: A two-level investigation of the relations with job and team satisfaction. *Personnel Psychology*, *54*(1), 51-69.

Walther, J. B. (1997). Group and interpersonal effects in international computer-mediated collaboration. *Human communication research*, *23*(3), 342-369.

West, M. A. (2002). The human team: Basic motivations and innovations. In N. Anderson, D. S. Ones, H. K. Sinangil, & C. Viswesvaran (Eds.), *Handbook of industrial, work and organizational psychology, Vol. 2. Organizational psychology* (pp. 270–288). Sage Publications, Inc.

Westermann, K., Bedard, J., & Earley, C. (2015). Learning the "craft" of auditing: A dynamic view of auditors' on-the-job learning. *Contemporary Accounting Research,* 32(3), 864-896.

Widmann, A., Messmann, G. & Mulder, R. (2016). The Impact of Team Learning Behaviors on Team Innovative Work Behavior: A Systematic Review. *Human Resource Development Review.*15(4), 429-458.

Wiese, C. W., & Burke, C. S. (2019). Understanding team learning dynamics over time. *Frontiers in Psychology*, 10, 1-14.

Wiese, C., Burke, C., Tang, Y., Hernandez, C. & Howell, C. (2021). Team Learning Behaviors and Performance: A Meta-Analysis of Direct Effects and Moderators. *Group & Organization Management*, 0(0) 1–41.

Wilks, T. J. (2002). Predecisional distortion of evidence as a consequence of real-time audit review. *The Accounting Review*, *77*(1), 51-71.

Wilson, J. M., Goodman, P. S., & Cronin, M. A. (2007). Group learning. *Academy of Management Review*, 32, 1041-1059.

Wong, S. S. (2004). Distal and local group learning: Performance trade-offs and tensions. *Organization Science*, 15, 645-656.

Zaccaro, S. J., & Bader, P. (2003). E-leadership and the challenges of leading e-teams: Minimizing the bad and maximizing the good. *Organizational dynamics*, 31(4), 377-387.

Appendix A: In-depth description of the search strategy

For the first search focusing on virtual teamwork in the auditing profession, we searched for published empirical research papers in two databases, Web of Science and EBSCO Business Source Complete. These databases provide access to a broad set of journals but emphasize business-related journals. The search query used is remote audit* OR international group audit* OR offshoring. The hits per database were recorded (EBSCO Business Source Complete: 1565, Web of Science: 63), screened for duplicates (N=1), and the abstracts and titles were screened for inclusion (N=1627). The inclusion criteria used were papers a) published in peer-reviewed journals of which the full texts are available in English; b) included insights on auditing and dispersion or virtual teamwork; and c) mainly focused on professionals working in natural work teams performing tasks relevant to the organization. These inclusion criteria were chosen to ensure the relevance of papers, sufficient quality, accessibility, and readability to other interested parties. Consequently, the abstracts of the included papers (78) were screened before the full text were analyzed for suitability. In these two steps, papers were excluded (N=67) from the final sample for the following reasons: a) the paper involved evidence from student teams or natural work that performed tasks that had no relevance to the organization; or b) no findings from the auditing profession were included. From the papers (N=10) that remained after this round of assessment for suitability, we backtracked the references included in these papers to identify additional relevant papers for this review (N=3). This procedure of identification and selection eventually resulted in a final sample of 13 papers to be included for the review. For a complete overview of the identification and selection procedure underlying the first search of this review, we refer to table 1.

Table 1: Overview of identified and included studies search 1

Review step	Number of papers
Number of papers identified	1628
Duplicates	1
Abstracts screened	1627
Papers included	78
Papers retained	10
Papers identified through backtracking	3

Total sample	13

For the second search focusing on drivers and inhibitors of team learning behaviors in virtual teams, we used a broader set of large databases, namely Web of Science, EBSCO Business Source Complete, Psychology and Behavioral Sciences Collection, APA PsycInfo, and APA PsycArticles. These databases provide access to a broad set of journals, including business and psychology journals, reflecting the fragmentation of virtual team literature across multiple streams of literature. The search query combines a set of synonyms for virtual teams derived from Raghuram et al. (2020) with search terms from seminal review studies on team learning behaviors, such as Decuyper, Dochy & Van den Bosche (2010), and Widman, Messmann & Mulder (2016). For a complete overview of the search terms for the second systematic literature search, we refer to table 2.

Table 2: search terms used for second literature search

Concept	Search terms used
Virtual team	virtual team*, virtual group*, virtual work*, distributed team*, distributed group*, distributed work*, mobile work*, remote work*, dispersed group*, dispersed team*, dispersed work*, technology-mediated work*, technology mediat* team*, technology-mediated group*, computer-mediated group*, computer mediat* team*, computer mediat* work, telework*, telecommut*, distance work*, distance team*
Team learning behaviors	team learn*, collab* learn*, coop* learn, group learn*

The resulting hits per database were recorded (Web of Science: 166, EBSCO Business Source Complete: 1109, Psychology and Behavioral Sciences Collection: 193, APA PsycInfo: 78, and APA PsycArticles: 90), screened for duplicates (N=135), and the remaining abstracts and titles were screened for inclusion (N=1501). The inclusion criteria used were a) papers published in peer-reviewed journals of which the full texts are available in English; b) papers that matched the definitions for virtual teams and team learning behaviors mentioned in this paper; c) included evidence from professionals working in natural work teams performing tasks relevant to the organization; d) presented or aggregated results to the team level. The abstracts of the included papers (N= 64) were screened first before the full text was analyzed

for suitability. In these two steps, papers were excluded (N= 52) from the final sample for the following reasons: a) the paper involved evidence from student teams or natural work that performed tasks that had no relevance to the organization; b) Learning was considered as the context of the paper and not a variable of interest: c) Results either provided at the individual or organizational level. From the papers that remained after this round of assessment for suitability (N=11), we backtracked the references to identify additional relevant papers (N=6). This procedure of identification and selection eventually resulted in a final sample of 17 papers to be included for the second systematic literature review. For a complete overview of the identification and selection procedure underlying the first search of this review, we refer to table 3.

Table 3: Overview of identified and included studies search 2

Review step	Number of papers
Number of papers identified	1636
Duplicates	135
Abstracts screened	1501
Papers included	64
Papers retained	11
Papers identified through backtracking	6
Total sample	17