Article

JIM
ISSN: 2183-0606
(CC BY 3.0)

Vol. 11, 2 (2023)
p. 71-117
AM: Mar/2023
SM: Feb/2022

Creating Global High-Performing Innovation Teams – Insights and Guidelines

Mikael Johnsson[1]

[1]School of Innovation, Design and Engineering, Mälardalen University, Box 325, 631 05 Eskilstuna, Sweden. | *mikael.johnsson@mdu.se*

Abstract

This study proposes a model, process and guidelines supporting the creation of global high-performing innovation teams. As global innovation work by teams has become more common, global companies conducting or aiming to conduct global innovation work would benefit from using the suggested proposals. Through a two-pronged research approach, data were collected through a systematic literature review to identify key factors enabling global innovation work from the innovation team perspective and its context, which were validated through interviews and questionnaires with senior management, management, and team members involved in innovation teams spanning six countries. The analysis enabled the proposition of an original model describing a global high-performing innovation team and its context and perspectives alongside a process and guidelines to create such teams in practice, adding knowledge to previous literature, particularly the research field of Innovation Management. Limitations and further research are discussed.

Keywords: Innovation Management, Innovation Team, Virtual Team, Global Team, Innovation, Group Development, Team Development.

Cite paper as: Johnsson, M., (2023). Creating Global High-Performing Innovation Teams – Insights and Guidelines, *Journal of Innovation Management*, 11(2), 71-117.; DOI: https://doi.org/10.24840/2183-0606_011.002_0004

1 Introduction

This research is focused on global high-performing innovation teams (gHIT). The background of this research is rooted partly in the increased need for innovation work conducted by teams (Zhang et al., 2021) and the technical equipment that enables virtual innovation work (Henttonen & Blomqvist, 2005), minimize time for relocation and increase level of freedom (Ebrahim et al., 2009c), ease of communication, and decision-making at a distance (Darics, 2020). Also, companies have implemented travel restrictions to reduce travel due to its negative impact on the environment (Morris, 2008), but also because travelling makes people less productive (Czeisler and Fryer, 2006; Sack, 2009), and has a negative effect on work quality (Lahiri, 2010). Yet another reason for decreased travel is the development of hybrid office workplaces, where employees are allowed to conduct work from home when suitable and applicable, i.e., work remotely and meet through technical equipment. Still, in the changed work situation, innovation work must remain for companies to be sustainable (Jagersma, 2003; Dobni, 2006). At the same time, it is essential to innovate quickly. New products (e.g., services and processes) are introduced to the market at an ever-increasing pace (Menon et al., 2002; Barczak et al., 2009) and 'fast companies' have an advantage over 'slow companies' (Narasimhalu, 2005; Kuckertz et al., 2010). To overcome the challenges involved in fast work, teams are suggested, as they are shown successfully to reduce development time (Highsmith, 2009) to a higher quality (Edmondson & Nembhard, 2009). As

the interest in creating innovation teams has increased (DeCusatis, 2008), Johnsson (2017a) defined innovation teams as purposefully developed to conduct innovation work, which significantly differentiates innovation teams from other teams created for other purposes. There is, however, also a significant difference between virtual and global teams. As the use of communication technology has been rapidly implemented in everyday work, allowing for virtual meetings—whether the attendees happen to be in the same room or on the other side of the planet—the definition used in this research is that global team members cannot meet in person without travelling large distances (Franz, 2012; Derven, 2016). In other words, in a global innovation team, members are dispersed across countries or continents, unable to meet or communicate without technical devices.

For global companies, however, the setting is quite different to that of local companies when it comes to innovation, as global companies can more easily attract talent (Manning et al., 2008), and work can continue around the clock (Haywood, 1998). However, when building global innovation teams, the group development process must still be considered, meaning handling a group that emerges as a team through the phases of forming, norming, and storming to start performing' (Tuckman, 1965; Wheelan et al., 2020) at a distance. For a group to become a team and start performing may take about 4–6 months, and only a few teams become high-performing due to internal conflicts (Wheelan et al., 2020). At the same time, the team must apply innovation methodologies, which are complex by nature and depend on individual and team efforts involving diverging and converging perspectives (Haner, 2005; Backström et al., 2011).

However, there are challenges specific to such settings, as cognitive proximity affects knowledge sharing (Hung et al., 2021), which is vital for collaboration and, therefore, innovation (Balsamo et al., 2008). Further, virtual teams often suffer from lack of physical interaction, technophopbia, and processes to align common work processes and cultures (Ebrahim et al., 2009a). Even though research clearly shows that the team leader should understand the processes of group formation (West et al., 2004; Hallgren, 2009; Adkins, 2010), there have been problems related to group dynamics that have led to struggles with innovation; namely, the wasting of valuable time and energy. One reason for such a struggle might be that there is no time to properly create these kinds of teams (Edmondson & Nembhard, 2009). Still, when reviewing structured ways of creating innovation teams, there is a lack of focus as to how to prevent the problems that arise in the development of the group. Additionally, to meet the ever-increasing pace of new product launches, global innovation teams should preferably avoid the 'storming' phase to become high-performing as fast as possible, as it otherwise risks consuming valuable resources. This research sheds light on how best to support the creation of gHITs.

The remainder of this paper is organised as follows: Section 2 presents a literature review; Section 3 presents the methodology used in this study; Section 4 presents the findings; and finally, Section 5 discusses the findings and concludes the research, and offers suggestions for further research avenues.

2 Theoretical background

This section presents relevant research related to gHIT with the purpose of clarifying how the research field has emerged from group development towards global high-performing innovation teams and the factors enabling this work, distilling the research gap into the research question used to guide this study.

2.1 Towards global high-performing innovation teams

Numerous models have emerged in previous research to understand the complexity of effective groups and teams. For example, the 'forming–storming–norming–performing' group dynamic process was proposed by Tuckman in 1965. The model explains how a new group emerges through different phases, where the members in the storming phase challenge management and each other, and if successful, will establish norms and ways of working together. The group transforms into a team at the end of the norming phase and starts performing. The model was further developed to include 'adjournment' to demonstrate the ending of a project team (Tuckman & Jensen, 1977; Wheelan et al., 2020). Notable, according to Wheelan, a group may develop into a performing or high-performing team in the fourth phase. Moreover, knowledge of group development emerged, including team collaboration Rubin et al. (1977). Later, factors such as accountability, commitment, and skills were added by Katzenback and Smith (1993) to elaborate on team effectiveness and performance results, followed by the T7 model proposed by Lombardo and Eichinger (1995). They also stressed the importance of, for example, team members' trust, team leadership, and culture. Furthermore, LaFasto and Larson (2001) suggested that the organisational environment is a key component. Hackman (2002) added the importance of context and team members' fit in the team as key components of team productivity. Another theory was that team dysfunctionality hindered team effectiveness, where factors such as lack of trust, commitment, accountability, and results were the core of poor performance Lencioni (2002).

However, groups and teams are fundamentally different. In this study, I define a team to be a social context of a minimum of two individuals whose members perceive themselves as such and are perceived by others as members (Cohen & Bailey, 1997). For a group to become a team, its members must also develop, for example, mutual trust and norms (Backström & Olson, 2010; Wheelan et al., 2020).

In a simultaneous research track, researchers also noticed groups and teams suitable for innovation work; sometimes referred to as 'team innovation', where teams tackle specific problems (Thayer et al., 2018). Farris (1972) found that the setting of R&D groups affected innovation performance. Managers did not need to possess innovation skills to achieve innovative results. In the 1980s, self-directed multi-functional workgroups were created for specific tasks, such as product development (Zuidema & Kleiner, 1994). A few years later, interest in innovation teams increased. Donough III (2000) investigated factors contributing to cross-functional product development teams, which was further developed by West et al. (2004), who proposed a methodology consisting of twelve steps for developing innovative teams, including team composition as well as its input and output. The first step was to identify the task, followed by identifying external demands, selecting team members with a focus on skills and diversity, securing organizational rewards, creating a learning and development climate, fostering an atmosphere of innovation, establishing norms of innovation, encouraging reflexivity in teams (i.e. encouraging them to stop working for a while to reflect on the situation), ensuring that the team leader's style is appropriate, managing conflict constructively, and aiming to bridge and coordinate competencies. In their research, Thayer et al. (2018) concluded similar aspects important for team innovation, such as composition, cognition, communication and knowledge integration, conflict, creative leadership, and context. In the same timeframe as West et al. (2004) and McGreevy (2006a; 2006b) suggested a process for creating teams in a structured way involving top and middle management as well as potential team members in the process. Following the process, it encourages innovation. From a practical point of view, he suggests that one should start by gathering information on what teamwork is and how it affects the organization, followed by ensuring that top management is committed to the teamwork approach and that middle management is on the same track. The following steps plan

for changes to the culture and management structures, and selects team members based on their applicability and willingness to develop as a team. Furthermore, the team members should have management's approval and support to participate in the team and be selected on an X-functional basis.

In parallel to research on innovation teams, research on innovative organisations emerged as well, suggesting that organisations should involve all employees (Xu et al., 2007) and that ordinary employees could drive innovation initiatives as teams (Kesting and Ulhöj, 2010; Kristiansen and Bloch-Poulsen, 2010; Bäckström and Mosleh, 2021). Recently, Chatzi et al. (2022) explored how personality composition affected team innovation and concluded that diverse emotional stability among team members could harm innovation implementation. Zhang et al. (2021) investigated how leadership enhanced innovation in work teams and concluded that ambidextrous leadership promotes individual and team innovation. The focus on creating high-performing teams has also emerged. Cheruvelil et al. (2014) developed a model outlining the characteristics of a high-performing research team. They specifically highlight the need for: 1) diversity regarding ethnicity (gender, culture), career stage, past collaboration with other team members, personal characteristics, and point of view; 2) interpersonal skills, such as empathy, honesty, clarity, integrity, and accountability, followed by excitement about research goals, personal commitment and trust; 3) team functioning, enfolding creativity, ideation, problem-solving conflict resolution and establishing norms; 4) and team communication including talking, listening, body language, and tone. These results are shown, for example, as published knowledge and new high-performing collaborative research teams. It also states that conflicts are a "normal and necessary part of becoming a high-performing collaborative research team" and therefore suggests tools and exercises to respond to conflicts, as they occur. More recently, building on system-, organisation -, group- and innovation management theories and previous research, Johnsson (2017b) proposed a five-step process for creating innovation teams, aiming at the high-performing stage and avoiding group dynamic problems. In his process, the first step is to ensure management's commitment and direction of the forthcoming innovation work. The second step is to identify a convener whose primary work is to gather appropriate team members and establish a culture of shared leadership in the forthcoming innovation team. The third step is to prepare the convener for their job through brief education on innovation-related processes, factors that enable innovation teams' work from the organisational, team, and individual perspectives, and the introduction of the group development process to avoid and handle potential group dynamic problems at the time the team is created. The fourth step is to gather the team members according to the innovation direction set by the management, meaning that there is no innovation team that is the best fit for all initiatives (i.e., there is no 'one-size-fits-all' team). While gathering 3–7 but preferably 4–6 team members, besides being knowledgeable, they should be entrepreneurial, willing to participate, and proud to take on the challenge. As they are invited to join the nascent innovation team, they are also introduced to agile innovation management and the group development process. Small teams are more effective than large teams (Hoegl, 2005; Wheelan, 2009), and larger teams than seven people will likely cause conflicts (Weiss & Hoegl, 2016) and social loafing (Ringelmann, 1913; Clark, 2003; Dew & Hearn, 2009). The fifth and final step is to initiate the innovation project, in which the first task is to develop the team's norms and ways of working together—leading the team together through co-leadership. Following these suggested steps and taking the time for preparation will give the innovation team the potential to advance to the performing and high-performing stages without going through the storming phase. Therefore, Johnsson (2017b) suggests that an innovation team should be formed on purpose, which comprises people who are the best fit for the innovation project. However, due to the difficulties in conducting innovation

work among inexperienced managers and innovation teams (recognised as, for example, lack of knowledge, conflicts, and lack of experience in decision-making), recent research stresses the importance of training and facilitation by an experienced individual to enable practical work (Johnsson, 2018; Martínez-Moreno et al., 2020).

In yet another parallel research track relevant to gHIT, research on creating virtual and global innovation teams has emerged. Prasad and Akhilesh (2002) found that the performance of global virtual teams is affected by strategic objectives, work characteristics, and situational constraints. Here, the team structure for, for example, team processes and degree of 'virtual-ness' plays a significant role in team performance. Sivakumar and Nakata (2003) suggest, on a conceptual basis, that based on the expected novelty of the new product, new global product teams should be balanced with regard to cultural aspects, as they have found, for example, that Americans, Europeans, Indians and people from China all behave differently in new product development and teamwork. Without considering the innovation aspects, Hertel et al. (2005) suggest a process of five phases to create virtual teams: 1) preparation, where team members are selected, tasks are designated, and technology is implemented; 2) launch, where teams should meet for a kick-off face-to-face to get to know each other and develop trust; 3) performance management, where the focus is on managing and monitoring the virtual team from a distance, to establish communication and feedback channels, and to support self-management and autonomy; 4) team development and training in the use of technical equipment; 5) disbanding; i.e., the team dissolves and thereby might feel both grief about separation and enjoyment and satisfaction in the team's achievements. In another study by Lin et al. (2008), the authors developed a model to understand virtual team performance. They found two workflows; both of which led to performance and satisfaction. In a sequence of activities, they concluded that, through communication, relationship building—or "cohesion"—was achieved and, therefore concluded that coordination leads to performance and satisfaction. In a longitudinal study spanning about a decade, Osgood (2012) explored better ways to connect and align, often global, innovation teams for high performance. In doing so, three aspects were identified through longitude research on established innovation teams – people, technology and place. In all, sixteen elements affecting connectivity within the three areas were evaluated: people (including mission, network, manner, leadership, structure, multitasking, interdependence, values, and diversity); and technology (mobility, process, and readiness); place (location, workspace, support, and paths). Those innovation teams that best aligned on the three aspects performed best. He concluded that the starting point was to establish the elements related to people first, followed by technology, and finally, place. The key findings were to focus on, in prioritised order: 1) mission, 2) multitasking, 3) leadership, 4) network, 5) mobility, 6) manner, 7) location, 8) structure. Project problems were most often caused by uncertainties, changes in leadership, too many simultaneous projects (multitasking), or antiquated technology. Also, it was more important to have access to people rather than being co-located, and the level of collaboration was dependent on trust, which in turn affected the project's performance. Finally, Osgood suggests that if the "people" elements are properly established, the technology and place elements can offer flexibility on how and when to work, also enabling teamwork from anywhere. However, at the same time he suggests that most of the core collaboration network should be located onsite, as close as possible, but also have paths to connect to others being located elsewhere.

To demonstrate what distinguishes important factors for effective virtual R&D teams' new product development, Ebrahim (2015) built a model comprised of three areas—technology, people, and processes. In his study, he evaluated these areas and concluded that management should focus on the team's new product development process rather than equip the team with the

most advanced technology or staff the team with overqualified members. Similarly, building on research on high-performing global teams, Derven (2016) created a framework that concludes important requirements for global virtual teams. Four factors are stressed as important: 1) diversity and inclusion—meaning that team members should have the right mix of functional, cross-cultural, and technical skills to avoid group-think, and that management are sensitive to cultural backgrounds and encourages the exploration of new ideas; 2) purpose—in that a clear purpose and goal should be agreed upon by the virtual global team and communicated outside the team; and 3) the people who are involved are involved based on their usefulness to the purpose at hand. Here, Derven suggests teams should be developed through four phases—"forming, storming, norming, and performing" —before they enter the high-performing phase. This process is stressed as being more complicated for virtual teams than for co-located teams. To support the group development process, building trust, inclusive leadership, and team recognition are key elements; and 4) processes should be established, including processes for establishing norms and ways of working, appropriate technology, accountability, and conflict management. Furthermore, Ford et al. (2017) suggested a six-step model to develop effective virtual teams. The first step is to establish sufficient technology to ensure communication, such as text, audio, and video. The second step is to onboard remote team members in processes and routines in the organisation. The third step is to select and prepare team leaders for diverse cultures, time zones and routines for remote meetings. The fourth step is to structure the team for its missions and tasks. It should be noted here that Ford *et al.* suggested that innovative and ambiguous tasks are difficult for virtual teams to handle. The fifth step is to support team tasks and socio-emotional needs by attempting to mimic face-to-face meetings, despite difficulties in doing so. The sixth and last step is to develop substitutes for direct leadership by providing clear tasks. The key to success is building trust among all leaders and team members involved. This means staffing the team with people who are, for example, trustworthy self-starters who have the relevant knowledge and skills. The team should also be prepared to handle different cultures and be trained in group collaboration.

Table 1. Overview of various types of virtual/global teams and teams' potential for innovation work.

Authors	**Zuidema and Kleiner (1994)**	**Prasad and Akhilesh (2002)**	**Sivakumar and Nakata (2003)**	**West et al. (2004),**	**Hertel et al. (2005)**
Team focus	Work groups	Global virtual teams	Global new product teams	Innovative teams	Virtual teams
Conclusion	Framework / model	Framework / model	Framework / model	Process	Framework / model
Fit for innovation	Potentially	Potentially	Yes	Yes	Not mentioned
Group development problems	Not mentioned	Not mentioned	Mentioned explicitly, proposing ways to avoid based on culture balancing	Mentioned indirectly, proposing indirect ways to avoid after the team is created	Mentioned explicitly, proposing ways to avoid after the team is created

Authors	McGreevy (2006a)	Lin et al. (2008)	Osgood (2012)	Cheruvelil et al., 2014)	Ebrahim (2015)
Team focus	Teams encouraged to innovate	Effective virtual teams	Distributed, global innovation teams	High-performing research teams	Virtual teams
Conclusion	Process	Framework / model	Process	Framework / model	Framework / model
Fit for innovation	Potentially	Not mentioned	Yes	Potentially	Potentially
Group development problems	Mentioned explicitly, proposing ways to avoid after the team is created	Mentioned indirectly, proposing ways to avoid after the team is created	Not mentioned	Mentioned explicitly, proposing ways to avoid after the team is created	Mentioned indirectly, not proposing ways to avoid

Authors	Derven (2016)	Johnsson (2017b)	Ford et al. (2017)	Thayer et al. (2018)	Zhang et al., (2021)
Team focus	Virtual teams	High-performing innovation teams	Geographically distributed team	Team innovation	Work teams / Team innovation
Conclusion	Framework / model	Process	Process	Framework	Framework
Fit for innovation	Potentially	Yes	Potentially	Yes	Yes
Group development problems	Mentioned explicitly, not proposing ways to avoid	Mentioned explicitly, proposing ways to avoid before the team is created	Mentioned indirectly, proposing ways to avoid	Not mentioned	Mentioned indirectly, not proposing ways to avoid

2.2 Factors enabling global innovation team's work

One research stream related to factors enabling innovation work are the barriers to innovation work. For example, (Hueske & Guenther, 2015) conducted a systematic review resulting in a model describing how factors related to external stakeholders, the organisation, the group, and the individual stifle innovation. Razinskas et al. (2022) identified stress factors hindering innovation teams' work through a literature review. However, one can see enablers and barriers as two sides of a single coin. Referring to design thinking (Brown, 2019), lean start-up (Ries, 2011), and agile innovation work (Ottosson, 2012), obstacles are just another task to pass on the way to the finalized product. Therefore, this research focuses on factors enabling global innovation teams' work. Still, the research field is scattered. Specific focus areas are identified for innovation, such as strategic management of innovation (Keupp et al., 2012), leadership in managing innovation in R&D teams (Parlak et al., 2017), management innovation (Khosravi et al., 2019), innovation climate (Newman et al. 2020), knowledge sharing for innovation (Castaneda & Cuellar, 2020), and frugal innovation (Niroumand et al. 2021), Regarding research on virtual or global virtual teams,

research is specified on, for example, technology enabling interaction (Fruchter & Bosch-Sijtsema, 2011), management challenges related to geographically-distributed teams (Seshadri & Elangovan, 2019), e-leadership (Contreras et al., 2020), trust (Cheng et al., 2021), and dispersion (Hung et al., 2021).

However, a few systematic reviews match the focus of this research from a more holistic perspective, providing an overview of the field (Table 2). Focusing on virtual teams, Ebrahim et al. (2009c) conducted a review exploring different types of virtual teams and their definitions, the use of virtual teams, and the benefits and disadvantages of virtual teams. He distilled his research into a model demonstrating three areas and twelve factors as central: technology, people, and processes. Scott and Wildman (2015) broadened the research perspective and conducted a literature review focusing on culture, communication, and conflicts from the perspective of global virtual teams. They concluded that culture and communication strongly influence processes and outcomes. Also, they found that conflicts are interlinked with culture and communication, which adds complexity to, for example, activities to conduct. In a more specific manner, Gibbs et al. (2017) conducted a systematic literature review including 265 articles on the impact of team type on virtual teams' processes. They concluded leadership, cultural composition, and the use of technology are key elements. They further proposed that emergent leadership is effective for virtual teams, that cultural diversity is positive for innovation, and that a common technological platform for everyone is important. In a systematic review of factors enabling innovation work, Johnsson (2017a) covered 211 articles. He identified a total of 20 factors enabling the works of innovation teams, which he organised into three categories: organisational, team, and team members' perspectives. In yet another review of virtual teams, Clark et al. (2019) conducted a systematic literature review covering 135 articles on factors influencing the performance of virtual teams. In analysing the articles, the authors identified a total of 22 factors considered to have a positive influence on virtual teams' performance.

Table 2. Overview of literature reviews of factors enabling innovation- and global virtual teams.

Authors	**Ebrahim (2009)**		**Scott and Wildman (2015)**	**Gibbs et al. (2017)**
Focus on review	Virtual teams		Global virtual team	Virtual teams
Factors in alphabetical order	People	Team selection	Communication	Cultural composition
		Reward structure	Conflict	Leadership
		Meeting training	Culture	Technology use
		Specify objectives		
		Performance measurement		
	Technology	Security		
		Selection		
		Location		
		Training		
	Process	Alignment process		
		Meeting structure		
		Performance measurement		
		Team facilitation		

Authors	**Johnsson (2017)**		**Clark et al. (2019)**
Focus on review	Innovation teams		Virtual teams
Factors in alphabetical order	Organisation	Management	Collaboration
		Culture	
		Climate	Commitment
		Strategy	Communication Characteristics
		Economy	Communication Structure / Guidelines
		Time	Communication Technology
	Team	Collaboration	Cultural Characteristics
		Culture	Cultural Diversity
		Climate	Dispersion
		Empowerment	Empowerment/Autonomy
		Processes	Intercultural
		Education	Interpersonal Characteristics
		Human resources	Intra-team Relationships
		Economy	Knowledge Transfer
		Need	Leader Qualities
	Individual	Mind-set	Leadership Activities
		Knowledge management	Leadership Structure
		Dedication	Leadership Training
		Incentives	Satisfaction
		Knowledge	Synchronicity
		Empowerment	Task Structure / Guidelines
		Capabilities	Team Characteristics
		Awareness	Trust
		Entre- / intrapreneurship	
		Time	

2.3 Research gap

Previous research related to gHIT has mainly been in three major fields: group development, innovation teams, or virtual/global teams. Research on group development has been found to be more and more complex and detailed, providing knowledge on the individual's role in the team and the organisation to achieve effective teams, and knowledge on how to detect teams in trouble and how to support them (Tuckman, 1965; Tuckman & Jensen, 1977; Rubin et al., 1977; Katzenback & Smith, 1993; Lombardo & Eichinger, 1995; LaFasto & Larson, 2001; Hackman, 2002; Lencioni, 2002; Wheelan et al., 2020). However, they focus specifically on the factors supporting group work from the organisational and team member perspective; for example, developing collaboration, building trust, and the effect of leadership on group members' or teams' work. Further, they do

not consider innovation aspects nor suggest processes to avoid the potential problems in group dynamics, but instead support groups or teams in solving group-related problems. Prior research on groups created for the purposes of innovation shows that management doesn't have to be innovative themselves (Farris, 1972), and that groups brought together for specific purposes can solve complex tasks (Zuidema & Kleiner, 1994; Thayer et al., 2018). Research on employee-driven innovation teams (Kesting and Ulhöj, 2010; Kristiansen and Bloch-Poulsen, 2010; Bäckström and Mosleh, 2021) had the intention to develop innovation teams, but as there was no specific process for developing the team used at the time, the teams ran into problems. In the same era, processes on how teams could be created for innovation work were developed (West et al., 2004; McGreevy, 2006b, 2006a). However, group dynamic problems are mentioned implicitly and indirectly or as an issue to solve as the team encounters difficulties. The exception is work by Sivakumar and Nakata (2003), which revealed that cultural dynamics play an essential role in global product development teams. Cheruvelil et al. (2014) address the high-performing aspects, suggesting a framework of factors promoting high-performing research teams, stating that conflicts are a natural and necessary part of the development process. On this matter, Johnsson (2017b) suggests the opposite, as he claims conflicts are a waste of resources, referring to Ekvall's (1996) research on innovation climate, where he concludes that lack of conflicts is a success factor for innovation. In his research, Johnsson (2017b) suggests a process to create high-performing innovation teams, where he addresses how to tackle potential group dynamic problems and introduces the innovation process to increase the understanding of areas of complexity. On the other hand, he does not consider the virtual nor the global aspects, which Osgood (2012) does. However, the group development process is not addressed as part of setting up and aligning the distributed global innovation teams for high performance. Recent research on team innovation highlights that a diverse mentality can harm innovation (Chatzi et al., 2022), and that ambidextrous leadership fosters individual and team innovation (Zhang et al., 2021). However, the aforementioned research does not consider how to create these teams or global aspects.

A similar scenario regarding previous research on virtual and global teams can be observed. Frameworks on virtual teams are proposed, considering various factors enabling global innovation work, such as the use of technology and the remote aspects of leadership and culture (Ebrahim, 2015; Derven, 2016), and Ford et al. (2017) propose a process on how to create effective virtual teams. However, the innovation aspects and the potential group dynamic problems are not mentioned directly. In a more extensive review of factors enabling innovation work, Johnsson (2017a) proposes that factors are different and partly overlap the organisational, team, and individual perspectives, which to some degree is reminiscent of Ebrahim et al. (2009), where they divided the enabling factors between three areas that are interlinked with each other. Nevertheless, Johnsson (2017a) does not consider the virtual nor the global aspects of innovation work, which Clark et al.'s 2019 study does. In their review, they have identified factors that have a positive influence on virtual teams' performance, but they are not organised or clustered other than by the number of articles identified.

The theoretical background shows that previous research does not cover the whole of how to create gHIT. Instead, frameworks, models, processes, and systematic reviews are parts of the whole. Regarding processes to create the various teams related to global innovation teams, a top-down approach can be observed. Meaning, the process of creating a global innovation team begins at the top level of the organisation and works its way down to the individual team members. In this work, factors enabling innovation and global work (Prasad and Akhilesh, 2002; Hertel et al., 2005; Lin et al., 2008; Ebrahim et al., 2009; Scott and Wildman, 2015; Johnsson, 2017a; Gibbs et al., 2017b; Thayer et al., 2018; Clark et al., 2019) are identified as parallel activities, also

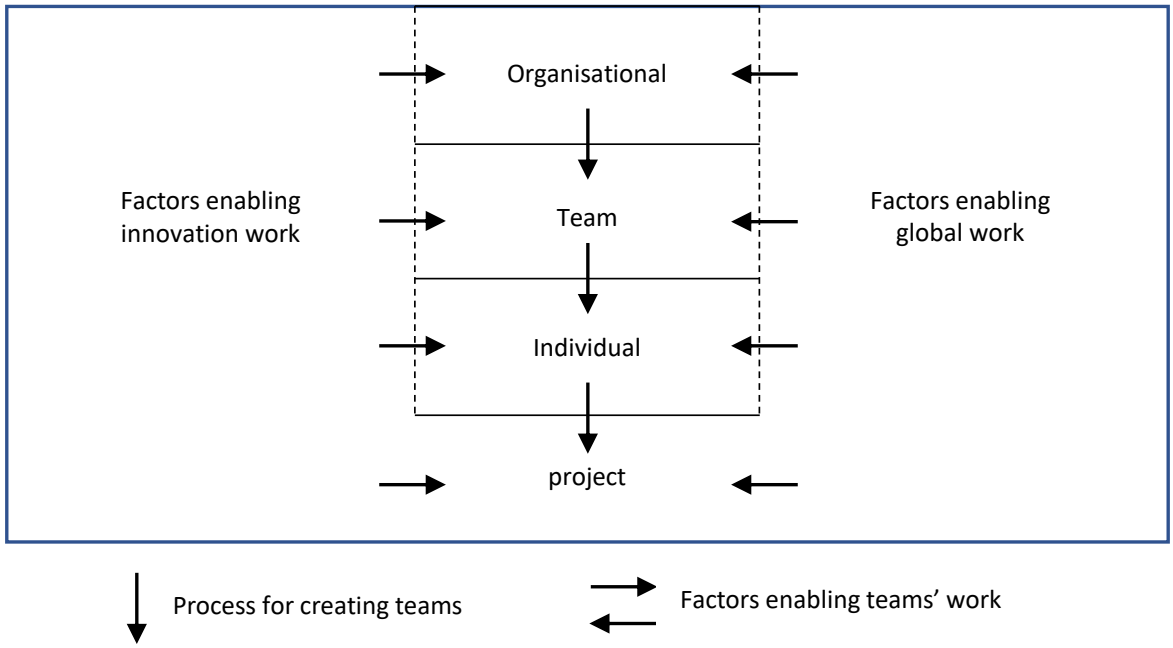

Figure 1. The figure illustrates a top-down approach to creating innovation teams (horizontal arrows) and factors enabling innovation and global work (vertical arrows).

dependent on the same top-down process approach. This complex setting is concluded into an overall model to illustrate their relationship (Figure 1).

What is not yet clarified in previous research, however, are which factors enable global innovation teams' work should be addressed at what step in the process of creating global innovation teams, aiming for high performance. Therefore, a research question was formulated: *how to support the creation of global high-performing innovation teams (gHIT)?*

3 Methodology

In this research, design research methodology (DRM) (Blessing & Chakrabarti, 2009) served as a source of inspiration, and its first two steps were conducted. In the first step, research clarification, the research problem is defined, followed by the second step: gaining an understanding of the problem and developing a conceptual process on how best to create global high-performing innovation teams. To accomplish that, a two-pronged research strategy was chosen. First, a systematic literature review was conducted to identify relevant factors enabling global innovation work (global innovation enablers), as previous reviews lacked that knowledge. Second, a case study was conducted based on the findings from the systematic literature review. Questionnaires and interview guides were developed to collect empirical data from relevant respondents. Finally, a conceptual model and process supporting how to create gHITs were developed based on the collected and analysed data.

3.1 Systematic literature review

To create an overview of the literature on global innovation enablers, a systematic literature review was conducted. This work launched from Johnsson's (2017a) and Clark et al.'s (2019) systematic literature reviews on innovation enablers and influencing factors for virtual teams. They were selected based on their comprehensiveness in their respective fields, as the two combined include

both the virtual and innovation aspects of innovation teams. Predefined search strings covering a broad perspective of the research area were used (Table 3).

As innovation management is a multidisciplinary research field, two appropriate search engines were used. The search engine Primo, a search engine provided by the university, was used, covering multiple-disciplinary databases, such as Scopus and Web of Science. Also, Google Scholar was used, as it provides easy access to high-quality research covering multi-disciplinary research (Martin-Martin et al., 2017). Eighty-eight articles were identified. For articles to be relevant to the current study, the title and abstract needed to explicitly contain keywords or phrases leading to (or interpreted as) factors enabling the work of global innovation teams. After reading the titles and abstracts and downsizing the identified papers accordingly, a total of 73 articles remained, which were thematically analysed (Boyatzis, 1998) and categorized into nine areas regarding global aspects as outlined by Johnsson (2017b) and Clark et al. (2019)'s research (as detailed in chapter 4.1): communication, technology, trust, management/leadership, collaboration, diverse competence, interaction, sense-making, and culture.

Table 3. Search strings used in the literature review related to global innovation teams.

Search strings	Search engines	Factors affecting global innovation (In order of the volume of identified articles)
"virtual team*" AND innovation OR "product development" OR design	Primo	Communication (19) Technology (13)
"distributed team*" AND innovation OR "product development" OR design	Google Scholar	Trust (11) Management/leadership (10) Collaboration (6) Diverse competence (5)
"global team*" AND innovation OR "product development" OR design		Interaction (4) Sense-making (3) Culture (2)

3.2 Case study

Case sampling

To build empirical understanding related to the global innovation enablers, a case study was conducted. Two global companies participated in the study: Company A and Company B. Both companies were selected based on their ongoing global innovation work; i.e., both companies conducted global innovation work in different time zones and worked similarly to each other in terms of innovation work. Company A has sites in Sri Lanka, Sweden and the United Kingdom, and Company B has sites in India, Sweden, and Switzerland. Although the companies are different, the context was overall the same. This means that the participants, for example, work cross-borders and cross-culturally in teams in an R&D context and in different time zones, and work in agile sprints using the Scrum methodology. Hence, representing the common, it is argued that the settings fit a single-case research design (Yin, 2014). In this study, 25 respondents participated, representing different perspectives (Table 4); that is, senior management, management, and team members, as influenced by Johnsson's (2017b) research; i.e., they were all managing or conducting global innovation work in teams, and therefore qualified to participate. All participants were interviewed and filled in a questionnaire. The respondents volunteered and were allowed

to refrain from answering questions. The data collected were stored following university regulations.

Table 4. Participants and distribution of respondents between sites.

Company	Site	Team members	Management	Senior management
A	Sri Lanka	3	1	—
A	Sweden	2	1	2
A	United Kingdom	3	1	—
B	India	3	1	—
B	Sweden	1	1	1
B	Switzerland	3	2	—
Total respondents		15	7	3

In general, multiple data sources add richness, which enables in-depth analyses and data triangulation (Yin, 2014). In accordance with direct content analysis (Hsieh & Shannon, 2005), a semi-structured interview guide (interview guide) and a statement-based questionnaire (questionnaire) were developed based on the systematic literature review and research by Johnsson (2017b) and Clark et al. (2019) (Table 5). The interview guide contained 111 open-ended questions, and the questionnaire contained 152 statements, covering 23 areas related to the work of global innovation teams. The interview guide allowed for follow-up questions. For the questionnaire, depending on the answers to nine of the questions, pre-set follow-up questions were designed.

Table 5. Areas of questions, questions, and number of potential sub-questions in the questionnaire within the interview guide and questionnaire.

#	Areas of questions in the interview and questionnaire	Questions in the interview guide	Questions in the questionnaire	No. of pre-planned potential sub-questions
0	Demographics	1–9	1–6	0
1	Innovation	10–11	7–8	0
2	Creativity	12	9	0
3	Education	13–15	10–15	0
4	Project	16–21, 84–93	16–26	0
5	Team	22–33, 94–111	27–41	0
6	Collaboration	34–35	42–46	1
7	Coordination	36–37	47–49	0
8	Sense-making	39	50–53	0
9	Resources	42	54–56	0
10	Performance	43–44	57–61	0
11	Dispersity	45–47	62–67	0
12	Communication (including technology)	50–57	68–94	47
13	Trust	58–63	95–104	12

#	Areas of questions in the interview and questionnaire	Questions in the interview guide	Questions in the questionnaire	No. of pre-planned potential sub-questions
14	Dedication	64–65	105–108	3
15	Relationship building	66–68	109–118	12
16	Cohesion (including interaction)	69–70	119–124	7
17	Culture	71–77	125–133	10
18	Knowledge	78	134–136	0
19	Knowledge sharing	79	137–140	0
20	Flow (workflow)	40–41	141	1
21	Quality (work quality)	81–83	142–148	0
22	Management and leadership	80	149–152	0
23	Conflicts	48–49	153	16
Understanding of the interview / questionnaire		112–113	154–155	0

Data collection

The interviews lasted about two hours. With explicit permission from all respondents, all interviews were audio-recorded. Additionally, notes were taken during the interviews. Using the interview guide, the respondents were asked, for example: "How do you define innovation?," "Have you been educated on how innovation management is conducted?," "What is your prior experience in innovation work?," "How do you use technology in communication?," and "How do you build relationships with the other sites?". The audio-recordings were transcribed through software (Otter and Descript.com were used for interviews in English and Amberscript for interviews in Swedish), generating about 12,000–18,000 words per interview, from which quotes were extracted. All responses to the questionnaire were obtained in an interview-like setting, meaning that I met the respondents in person, face-to-face or online (Microsoft Teams) for about forty-five minutes to one hour. During the online meetings, I shared the questionnaire on the screen to help clarify each statement. I read the statement to the interviewees, who responded with a number from 1 to 7, where 1 indicated "Do not agree at all", and 7 indicated "Fully agree." Notably, the questionnaire not only mirrored the interview but also concluded each focus area with two questions on whether it was perceived as hindering innovation. For example: "I consider myself experienced in using methodologies and tools for innovation work," "I have been educated on innovation management to the extent that I can apply it in practical work," "The projects that the teams usually work on are of a character that requires innovation work," "Due to the lack of innovation-related education for the teams, innovation work is hindered," and "Due to collaboration issues within the teams, innovation work is hindered."

3.3 Data analysis

For this study, the multiple data sources (i.e., the interviews and questionnaires) provided in-depth data. The interviews provided data "on how and what," and the questionnaire provided data "on the extent" to which the respondents assessed certain situations related to the areas of focus, which enabled data triangulation. In this work, patterns, factors, processes and sub-processes, and factors supporting or hindering the creation of gHIT were identified (Boyatzis, 1998; Blessing and Chakrabarti, 2009). The theoretical framework formed the basis for analysing the data, in accordance with Yin (2013). A direct content analysis approach was used with pre-determined categories (Table 3), which enabled validating or conceptually extending the theoretical framework and identifying and proposing new phenomena (Hsieh & Shannon, 2005). During the analysis of the responses to the questionnaire, a grade of four or less (or more, depending on the statement) was chosen to allow thoughts for improvement to enable the work of global innovation teams.

A proposal contributing to answering the research question emerged through the data analysis. First, a model is proposed to visualise how a global innovation team and its context are related. Second, a model and guidelines are suggested, designed as a top-down approach. Together they support the creation of global high-performing innovation teams.

4 Findings

In this section, the findings are presented. First, the findings from the systematic literature review are presented, followed by the empirical findings from the interviews and questionnaires. Finally, a conceptual model and processes demonstrating how to support the creation of high-performing innovation teams are suggested.

4.1 Global innovation enablers—a systematic literature review

Following Johnsson's (2017a, p.9) logic, nine additional factors affecting global innovation teams were identified. In Table 6, they are charted together with the systematic literature reviews compiled by Johnsson (2017a) and Clark et al. (2019), followed by further explanations of their content in alphabetical order.

Table 6. Global innovation enablers in four perspectives: the global, organisational, innovation team, and team member perspective. Source: Johnsson (2021)

Global innovation enablers					
		Perspective			
Factors	Count total	Global	Organisation	Innovation team	Team member
Management	76	Z	X, Y, Z	Y, Z	
Collaboration	59	Z		X, Y	Y, Z
Mindset	53				X, Y
Characteristics	43			Y	Y
Knowledge management	40				X, Y, Z
Trust	41	Z		Y, Z	Y, Z
Technology	39	Z	Y, Z	Y, Z	Y, Z
Communication	37	Z	Z	Y, Z	Y, Z
Culture	26	Z	X, Y, Z	X, Y, Z	Y, Z
Climate	20		X	X	
Dedication	20				X, Y
Incentives	20				X
Interaction	19	Z			Y, Z
Knowledge	16	Z			X, Z
Empowerment	15			X, Y	X, Y
Process	15			X	
Education	12			X	
Capabilities	10				X
Human resources	10			X	
Awareness	9				X

Global innovation enablers					
		Perspective			
Factors	Count total	Global	Organisation	Innovation team	Team member
Entre-/intrapreneurship	9				X
Strategy	9		X		
Economy	8		X	X	
Time	7		X		X
Synchronicity	7			Y	Y
Satisfaction	5				Y
Task structure	4		Y	Y	
Need	3			X	
Sense-making	3	Z			Z
Dispersion	3			Y	Y
X = Johnsson (2017a), Y = Clark et al. (2019), Z = Systematic literature review (this study)					

4.2 Collaboration

Generally, global teams based on diverse functions positively impact collaboration (Batarseh et al., 2018), and distributed design speeds up the creativity process (Karlsson et al., 2005). It is even possible to develop high-performing teams that only meet through technical devices (Olaisen & Revang, 2017), wherein the sum of relationship, inter-personal trust, frequency of communication, and time spent in interaction determines the result (Peters and Manz, 2007; Olaisen and Revang, 2017). However, it is important to choose tools that support the development of shared knowledge, which to some extent is built through non-verbal behaviour, such as smiling, headshaking, and eye contact (Gressgård, 2011). In addition, workplace bullying should be taken seriously to enhance global team collaboration. It is strongly recommended to evaluate a team's potential members on negative workplace acts and abusive personalities before being assigned to the team (Creasy & Carnes, 2017).

4.3 Communication

In general, focusing on setting up a communication system for dispersed teams is vital, as communication is believed to build trust (Powell et al., 2006; Aldea et al., 2012; Olson and Olson, 2012) and resolve conflicts (Gibson & Gibbs, 2006). Communication is also important in reducing knowledge gaps and increasing knowledge transfer (Oshri et al., 2008; Pinjani and Palvia, 2013; Castellano et al., 2017;), avoiding loss of creativity (Chulvi et al., 2017), and creating shared understanding (Holton, 2001). Several scholars have further argued that the lack of effective communication affects performance negatively (Daim et al., 2012; Hosseini et al., 2017), meaning that communication tools play an important role (Törlind et al., 2005). Some even argue that frequent communication between the leader and team members creates a sense of inclusion and involvement (Gajendran & Joshi, 2012). One challenge here is to overcome or handle time zones while remaining in communication, as this is considered a barrier for co-located teams (Larsson et al., 2003; Yang et al., 2015; Jasper, 2019). It is also worth noting that language policies and training are needed for effective communication (Klitmøller & Lauring, 2013). Therefore, to spur communication, it is recommended to create side channels for instant or informal communication not concerning the entire team between members (Törlind and Larsson, 2002; Larsson et al., 2002, 2003; Törlind et al., 2005).

4.4 Culture

Culture plays a significant role in global teams, as different behaviours and perceptions affect interaction and performance (Dekker et al., 2008). Therefore, to overcome cultural issues, it is suggested to educate the involved parties in advance, especially on cross-cultural collaboration, reaching agreements and sharing knowledge on how to make progress (Duus & Cooray, 2014).

4.5 Interaction

On a holistic level, interactions can be divided into social and technical interactions, which both require continuous improvements to spur collaboration (Painter et al., 2016). The level of interaction affects the performance and education of global distributed teams, in which coordination and communication are key. Regarding trust within distributed teams, it has been pointed out that social capital is gained through interaction, in finding out who knows who and who knows what to learn who to trust. However, personal trust is significantly important in achieving team interaction (Ocker and Hiltz, 2012). It even becomes especially important when team members must rely on advice that is not in their area of expertise (Larsson, 2007). However, physical distance should not be a problem for innovation, as it is believed that the greater the personal relationship people have to the problem, the more significant the results will be (Tzabbar & Vestal, 2015).

4.6 Knowledge/function

Research has shown that diverse knowledge in global innovation teams supports innovation (Peters and Karren, 2009; Batarseh et al., 2017a, 2017b). In total, two studies discussing different roles in virtual teams, using Belbin's team role composition from 1981 and 2014, have been identified. The first study (Meslec & Curșeu, 2015) suggests that balanced teams perform best during the initial phases and that women in teams increase the quality and helps avoid conflicts to a greater extent compared to unbalanced teams. The second study (Eubanks et al., 2016) suggests that 'doers' are important for high performance.

4.7 Management/leadership

Virtual leadership has many challenges, such as creating a team and setting up communication channels (Manole, 2014). In virtual teams, not only does emergent leadership have positive effects on performance (Charlier et al., 2016) and coaching style (Rousseau et al., 2013), but also that positive and dynamic leadership combined with structure and communication is important (Fernandez, 2015). Relevant abilities for a leader in a virtual environment to possess include, for example, stimulating accountability, honesty, fairness, feedback, and to manage change (Roman et al., 2019). Also, distributed team leaders should develop a tolerance for ambiguity and be creative in establishing processes and structures (Contreras et al., 2020). Studies have shown that task-oriented leadership (Pinar et al., 2014) and leaders who build trust and psychological safety, set guidelines, communicate regularly, and build relationships increase the chances of creativity and success (Han et al., 2017). Furthermore, transformational leadership at the group level supports building team identity and collective commitment (Li et al., 2016). However, it has also been shown that consultants can serve as leaders, for example, in the recruitment of members and during training (Junemann & Lloyd, 2003).

4.8 Sense-making

In general, sense-making in distributed teams is complex. It involves several aspects of uncertainties for co-located teams, such as stakeholders, language barriers, interpretation of uncertainties, and which ambiguities should be addressed and discussed carefully (Laine et al., 2016). In practical design work, team members use various objects to explain the ideas or functions of an imaginary device (except for sketches and prototypes), followed by negotiations and decisions. Therefore, virtual environments aimed at easing common understanding are of essence for global design teams as a physical object is accessed at one place at a time (Larsson, 2003). Therefore, to solve some of these problems, software has been developed to support creativity and group decision-making (Chen et al., 2007), although physical objects have not been considered.

4.9 Technology

Technical equipment brings global teams together, allowing knowledge sharing (Majchrzak et al., 2000) and enabling support for relationship building (Henttonen & Blomqvist, 2005). Some scholars argue that it plays an important role in work life and personal perspectives (Laitinen & Valo, 2018), although at the same time it is complicated to communicate from a distance. Therefore, it is important for technology to be adjustable depending on its intended purpose (Dadriyansyah et al., 2010). There are numerous examples of technical equipment bringing remote team members closer, such as 'transparent' walls that allow people

to interact from a distance (Fruchter & Bosch-Sijtsema, 2011), 3D virtual environments (Bosch-Sijtsema & Haapamäki, 2014), knowledge management systems (Peña-Mora et al., 2000; Loebbecke and Myers, 2017), or wikis for sharing knowledge and for use as a design tool (Walthall et al., 2011). Importantly, just using the video feature through a webcam in an online meeting can help increase trust and collaboration (J. D. Olson et al., 2014). In contrast, monitoring team members can potentially lead to trust issues (Alge et al., 2004). It is also important to be aware that too much communication through technical devices can cause information overload compared to face-to-face meetings (Hammond et al., 2005). However, to stimulate team performance, different experiences and use of ICT should be discussed in the team to develop common rules or norms regarding the use of tools and training on how best to use them (Müller and Antoni, 2022).

4.10 Trust

Establishing trust within a global team conducting innovation work is important for team effectiveness (Peters and Karren, 2009; Muethel et al., 2011; Pangil and Chan, 2014). Several studies have shown that trust issues in global teams cause problems, such as collaboration and efficiency problems (Breuer et al., 2016; Alsharo et al., 2017). Allowing team members to become familiar with each other's behaviour can help build trust more easily (Robert et al., 2009). However, to stimulate trust in dispersed teams, standard team-building tools may be used (Holton, 2001) in addition to team feedback (Peñarroja et al., 2015). Establishing trust can stimulate information flow (Liu et al., 2008) and job satisfaction (Morris, 2008), and can be built by establishing open group communication as it is believed to create awareness of other group members (Cheng et al., 2021).

4.11 Factors affecting global innovation teams – Empirical results

In the following section, the empirical findings from the questionnaires (Figure 2 and Figure 3) and extracted quotes covering the areas of Table 5, are demonstrated. As some of the areas are related, they are clustered together.

4.12 Innovation

The definition of innovation differs widely; from offering something new (i.e., new to the firm, new to a region/country, or new to the world), to the market (European Commission, 2018), or to be implemented on the market (internally or externally) and thereby create value to the creator and receiver (Tidd & Bessant, 2018). Accordingly, all respondents showed the ability through the interviews (n 25/25) to explain what innovation is (although their definitions varied):

> Innovation:
>
> *"When I think about innovation, it's . . . I mean, there's obviously lots of different ways you can . . . to view it, but at its core is doing something better than it's been done before. And that could mean . . . Or something new, as well. So, not just something better, either doing something brand new or doing something better than before. So, it's doing something better. Could be it means there's less effort involved, it's high performance... automated something or come up with a new way of doing things. So, it's creating . . . It's doing, creating something new which is better than whatever's been done previously"*
>
> *Respondent 20, manager*
>
> *". . . Generally, innovation means like, I think finding out new ways of doing things, and introducing some new dimensions into things. So, in our like, in [Company A], how I feel it is finding out new ways to maybe to improve the way we work, or maybe to come up with better solutions. So, it's not only like, it's not only about products. It's not about innovating products only, but also innovations on processes. Well, how we work, but what should happen about the culture may be how can we improve that. So, in all dimensions, to find out something new that can improve things. So, I see it. . . "*
>
> *Respondent 12, team member*

4.13 Education on innovation and creativity

The questionnaires show that roughly all respondents (N =25) assessed the projects to require innovation work, except for one manager (1/7) and four team members (4/15). However, all respondents assessed that the projects contained problems requiring creative work. However, none (0/3) of the senior management members, about half of management (4/7), and slightly more than half of the team members (10/15) considered themselves knowledgeable in innovation management. Even fewer respondents considered themselves experienced in using methodologies and tools specific to innovation work. Of all respondents, six respondents assessed themselves as educated enough to conduct innovation work in practice; one senior manager (1/3), two managers (2/7) and three team members (3/15). The lack of education was confirmed by senior management (3/3) and all but one manager (6/7, one empty answer), as they answered the question, "The teams have been educated in innovation management to the extent that they can apply it in practical work". A similar response was received regarding creative tools. One manager (1/7) and seven team members (7/15) assessed themselves as knowledgeable enough to use creative tools in practice. Again, the lack of education regarding creativity was confirmed. One manager (1/7) assessed that team members had been educated in creative tools to the level they could apply them in practice. From the interviews, it was noticed that—even though about half of the respondents had been educated regarding innovation work tools (17/33) —they were not used due to the feeling of being too complicated. At the same time, the respondents explained that further education was planned for the near future to stimulate the use of innovation and creativity tools.

> Education:
>
> *"Relatively little. We have been introduced to the idea diamond, but in practice this has not happened, and we have tried to introduce other tools such as "six hats" or whatever it was called where you would put on different...perspective. We talked about it, but then it didn't happen."*
>
> *Respondent 2, senior manager*
>
> *"No, no"*
>
> *Respondent 17, manager*
>
> *"Not really. I mean, I . . . you know, a couple of years ago, there was an activity in another area which no longer belongs to our business, where we got an external consultant actually in, and they ran a short exercise project with us, which goes into this direction. So, there I was a bit in contact with these ideas. . . I found a webinar on our intranet about this topic. So that was the kind of education I got, so yes. Yeah."*
>
> *Respondent 16, team member*

4.14 Collaboration, team size, and sense-making

The data indicates that collaboration in the teams worked well, as confirmed by one senior manager (1/3), six managers (6/7) and fourteen team members (14/15). This was also reflected when it came to team size in this study. All team members were members of teams consisting of 8 members or fewer, agreed that they were optimised for innovation work. In the teams that were larger than eight persons, two of the team members (2/6) assessed it as being optimised for innovation work, while the other participant complained that team meetings were inefficient. Working globally in different time zones means that team members can meet online for limited office hours, which may cause problems in collaboration. In this study, management believed it was a bigger problem than the team members. Two senior manager (2/3) and five managers (5/7) believed time zones were not a problem, while more than half of the team members thought it wasn't a significant problem (9/15). However, opinions regarding whether time differences positively or negatively impacted team performance differed. Between team members and managers, opinions were split nearly down the middle. On the other hand, senior management thought it had a negative impact (2/3, one empty answer). Further, sense-making was to a great deal assessed as being conducted jointly by the teams (11/15), which all managers (7/7) agreed on, as did one senior manager 1/3).

Collaboration:

"The cooperation between the sites generally works very well. The problem is a lack of common time."

Respondent 2, senior manager

"... you don't really know much about other departments. It's kind of a little bit like a mystery."

Respondent 5, manager

"... we're spending considerable time to understand. Okay, what exactly is the problem here? But then I think there are challenges like, you know, the cost now, we are not meeting the customers ourselves, we get information from many different layers. So then. Maybe, I mean, then we have challenges like, Okay, do we really, is this really the problem that we understood? Is it really the problem? So that validation, I think, is a bit lacking, I guess, but I think as the team spends considerable time on trying to understand what the problem we are solving now... "

Respondent 12, team member

"Well, I think one of the biggest challenges is lack of common time. Because you know, reason like because of the daylight savings be the timing changes, it's very, very difficult actually. So instantly now actually, we have about one and a half on two hours common with UK. So, we have our mean, like to the product architect sitting at UK, and one of the experienced business system analysts as well sitting in UK so you know, the product market it is important for decision making, right? So, it's very difficult to schedule all the meetings within that short period and get things done."

Respondent 12, team member

Team size:

[Nearly ten. Eight, maybe? Eight? Yeah, let's go for eight."

Respondent 5, manager

"Yeah, I don't think, and I think larger teams will that efficient because there'll be a lot of communication involved. So, the smaller the better, it will be like five, six would be ideal. That's also depending on the sort of work, we have to, I think. If it's like once more functionality, there'll be maybe like, three or four people would be enough. But if it's like a functional area, like we have in projects. I think it's okay to have eight or nine people. So, it depends on the sort of that the team is assigned."

Respondent 11, team member

4.15 Coordination and dispersity

The assessment of how work tasks are coordinated between the sites differs between managers and team members. Overall, management thinks it works better than the team members. Two senior managers (2/3) and six managers (6/7, one empty answer) thought work tasks were fairly distributed among the sites. In contrast, two-thirds of team members felt work tasks were fairly distributed (10/15). Small talk locally was much more common than small talk with team members in other countries. Despite this, 'small talk', or non-work communication between team members occurs from a few times a week, a few times a month, to never, and none of the respondents felt isolated from the other sites except for two managers (2/7) and one team member (1/15). Due to being dispersed across geographic areas, none of the respondents had coffee breaks or lunches with the team members living abroad (25/25). Also, interviews revealed that time-zone differences played a part, but so did a lack of technology for informal meetings. However, locally, almost all the respondents (23/25) met for a coffee break or lunch every day or several times a week. The only exception was one manager (1/7) who met other team members once or a few times a month, and one team member (1/15) who never met with anyone.

Coordination:

"... Well, the idea of the stand-ups and meeting on a regular basis is that it actually gets discussed then. So, if somebody needs help, then they should be ... they can raise their hand

and ask for help on a particular area, and then another one of the team members can help them. . . "

Respondent 20, manager

". . . Basically, for any project, first we will define a work package then. So, they will assign the work packages to different people. So, for our team means any one work package is assigned, and I will be working on the work package. So, there'll be a deadline to finish that. So, so I'll be working on it. And I'll be discussing with them continuously every week. So, if I have any issues, any problems I'll discuss with them, or if I have any solutions or findings, I'll show it to them. So yeah, this is all we work every day."

Respondent 23, team member

Dispersity:

". . . When it comes to Sri Lanka and Sweden, I do not think that they are isolated because we. . . actually we were talking about this matter some time back. So, in Colombo's situation, and they're not isolated because people are here. But there is one case that one person is sitting here, the rest of the people who are distributed in Sweden and UK. . . But she didn't feel that she's isolated, that's the important thing. That she feels that she's included in the team all the time. And they try out different practices to distribute the work and communicate efficiently in between sites."

Respondent 13, manager

". . . No, I don't feel isolated because of the distribution. I'm not sure that because it is because we have most of the people here in Sri Lanka. Not sure about that. But the thing is, like if I feel like okay, I want to, as I said earlier. Now, if I want to talk to some other team member, and I know Okay, his or her schedule is full for the common time I log in from home or after work. So sometimes that becomes a solution. . . "

Respondent 12, team member

". . . The biggest challenge is the time difference. Because with this, you know, that daylight saving, we literally have like, one and a half hours, common time between Sri Lanka and us, which is really challenging. Now, that's the biggest challenge, because sometimes even today morning, I joined the stand-up meeting while I was driving, which might not be a good idea, which I should not do. But yeah, time is the biggest challenge. And because of that, we can't carry out some of the lengthy discussions you have to stop halfway through.

And the other challenge I have seen is not sitting in the same room, because some of the discussions, some of the design for designing, sometimes you need to give take the whiteboard discussion, like, you know, you, aaah. You, I think it will be very effective if you sit down in the same room, otherwise, we don't know. Quite the other people, they do pay attention to that. And they get distracted by some of the phone calls or because these things have we have we have experienced these things, they get distracted. So that's the other challenge. I see. Like taking the complex, complex design discussions remotely. And sometimes, you know, the people I have seen is. . . sort of, you know, some people, you know, naturally they dominate, some of the discussion, some of the sessions.

And if you're not in the same room, I mean, if you connect remotely, the people who don't really, you know, like, I wouldn't call the soft characters, but some people they don't they don't speak much. There are people like that. So, I have seen then they keep quiet. But after that meeting, when I talk to them, they say no, I didn't want to bring that up, bring this point out during that meeting. But I had this question. So how do you handle this? So, I have even lost this Monday, I experienced the same. And in some cases, language barriers. Count into that, I would say."

Respondent 8, team member

4.16 Resources and performance

Regarding whether there are enough resources to finish the projects in time, one senior manager (1/3), two managers (2/7), and about half of the team members (7/15) agreed that there are enough resources. Related to this, two senior managers (2/3), five managers (5/7, one empty answer) and ten team members (10/15, one empty answer) claimed that projects' scopes were reduced to meet deadlines, which indicates that the teams' performance was not optimal in relation to the circumstances.

> Resources:
>
> *"... it depends on the projects... If we're in a team and then we're lacking in a particular competence, then that's something that I would be trying to step in and find somebody to join or do a particular task, etcetera... Because it's not always possible to have an entire team with all the competencies. Or sometimes you only need a particular competency for a short time... "*
>
> *Respondent 20, manager*
>
> *"... So, equipment-wise I think Yes. There is. Knowledge-wise, I think, as I, as I told you, now, be me, it's good if we had more expertise on the functional area within the team. So, that's bit lacking at the moment, but we are trying our very best to develop it, you know, it takes some time to develop expertise... "*
>
> *Respondent 12, team member*
>
> Performance:
>
> *"We work on priority lists, and there is always more that can be done. But it's rarely the case that it doesn't work at all and we have to give up. We have our deadlines and then we adjust the scope, rather. And then there are things that don't come along that we're going to have to do later... We make some kind of plan and then there are lots of surprises along the way that allow us to cut the scope, but hopefully we have done the most important thing... "*
>
> *Respondent 2, senior manager*
>
> *"... what we're doing is if we feel like okay, we can reach the entire scope, we do a scope cut, and they find the best thing that we can do, and try to deliver it. So that mindset is there that we find, try to understand the minimum viable product, and then try to develop it and release... "*
>
> *Respondent 12, team member*
>
> *"I think in this project we had an extremely good estimation, yes. I think this is one of the first projects I actually was in where we mostly finished items in time."*
>
> *Respondent 15, team member*
>
> *"On how senior management think of teams' creativity and innovation in practice:*
>
> *Relatively poor. But I get the impression the times they get the chance to meet, it's much better. When they happen to be on the same site, it goes much better. In general, I think there's a lot to improve, maybe that they just take a step back and think that you can actually benefit from thinking a little before. I think they quite often think that it is more important to move forward."*
>
> *Respondent 2, senior manager*
>
> *"I think we're too quick to find a solution sometimes but...We have a framework that describes this very thing of front loading, gathering information and conducting current situation analyses, and not going into solutions without really looking at what problem we are trying to solve. That's how we try to work at R&D... The method is quite new to us, as we have seen that we tend to go for a solution too early... but it has not gone as well as one would have liked it to... But we have a gate where we make sure we've collected all the information we need... We're doing more and more like that now."*
>
> *Respondent 14, senior manager*

"No, I don't think so (creating enough creative and innovative solutions). It could be more, but it doesn't necessarily have to be their fault...We could get better if we did fewer things. Then there could be room to be more creative, to be more innovative. That's my analysis."

Respondent 14, senior manager

4.17 Communication

Communication is perceived as working well, according to management (6/7) and team members (12/15), while senior management thinks it could be improved (3/3). In this study, the team members do not complain about communication as such, but it is clear that team members assess that communication works better locally than it does with team members abroad. Of all respondents (N =25), all but one manager assessed that online meetings contain complex discussions. In complex discussions online, all respondents save one manager and three team members use tools other than audio meetings. At the same time, all senior managers (n =3), four managers (4/7) and six team members (6/15) preferred video meetings in complex online discussions; in total more than half of all respondents (13/25).

Communication is also about straightforwardness; meaning people say what they mean, not formulate responses ambiguously. Here, all respondents (20/25) save two managers (2/7) and three team members (empty answers) assessed the conversations with their managers as being straightforward. The same applied to the management's conversation with the team members.

According to the majority of the respondents; i.e., one senior manager (1/3), all managers (n =7), and 11 team members (11/15), the tools available for communication were assessed to be optimal for the work conducted. All respondents but one senior manager (1/3), one manager (1/7) and three team members (12/15) thought they knew the tools well enough to communicate the way they wanted. To some extent, the communication tools encouraged small talk, but they are not supportive of innovation or creative work. Out of all the respondents (N =25), four managers (4/7) and four team members (4/15) think they are.

Communication:

"It has been recognized in the retrospective, that they were not really sure of what the others in the team were doing. . . "

Respondent 2, senior manager

"In our leadership group, we made an effort a few years ago to start using the camera. And we all thought, oh, this was good. Then we stopped and I can't explain why... everyone agreed that it was fantastic. Now we can, like seeing our facial expressions, and I've tried to encourage teams, but you can't demand that people turn on the camera. I've tried it myself at meetings, but it hasn't happened, but I think that's one those things you can work out."

Respondent 2, senior manager

". . . I think with the camera, you are more focused. And of course, you have the chance also to notice the non-verbal communication of the other people. And I mean, I see it now, with my team and the corona situation, and I am supporting all the time to use the camera. But yeah. Many times we don't use it. . . "

Respondent 17, manager

"Mostly it's off (camera in meetings). . . I don't know. Partly maybe because if the network connection is bad it's not working so stable. But maybe that is the main reason. But I don't know, actually maybe it's also a cultural thing, having it on or off". . . "Yeah, I mean it's . . . Usually when you communicate I think it's . . . Actually, I prefer . . . I like to have it on, when I see the other person. I can see his face, I can see his mimic, his movements. . . "

Respondent 15, team member

". . . Yeah, we do straightforward communication unless it's very difficult. . . I mean. No indirect things."

Respondent 13, manager

". . . Basically, I think, yes, but the point is that probably it's easier if you work together quite a lot. And of course, just within the local team we had much more collaboration than between

the Swiss and the Swedish team. So from this point of view, we probably would have less . . . I'm not sure if . . . Yeah, communication would not have been that open. But I don't think this was related to the fact that it was like the local and the Swedish team. It's more related to how much we collaborated, or we had to collaborate for the way we were organized."

Respondent 15, team member

4.18 Trust

In the questionnaire, there were no indications of a lack of trust, with two exceptions. Of all respondents (N =25, one empty answer), one team member had trust issues, mainly with people at other sites, and one senior manager (1/3) felt mistrust from team members. In the interviews, it was expressed that it sometimes it was unclear as to what status projects were in, which was reflected to be related to cultural or communication issues. The feeling was that team members presented ideas not yet developed.

Trust:

"Yes"

Respondent 14, senior manager

"I trust my team completely."

Respondent 20, manager

"Yes"

Respondent 21, team member

4.19 Dedication

Dedication was not a problem. All respondents (24/25, one empty answer) assessed themselves as dedicated to the work.

4.20 Relationship, cohesion, and culture

All respondents (23/25, two empty answers) assessed that they had a good relationship with others. This was also reflected by feelings of cohesion, where senior management (2/3, one empty answer), all managers (7/7) and twelve team members (12/15, one empty answer) thought cohesion was good. The respondents assessed that respect for other cultures was well-established (23/25, two empty answers) and equally respected for all sites (21/25, four empty answers).

Relationship:

". . . professional relations among members. That is what I encourage, the professional relationship, not the personal relationship. But they do have some relationships, but it's not our expectation. The organization expectation is to have a bit of professional relationship to get the work done."

Respondent 13, manager

"*There has been this Instagram account for our team, where most of the projects people have joined, so you can post things, post personal photos, or whatever. So that's been one way that I think you're trying to improve the relationship with other sites. Yeah, that's about it,"*

Respondent 11, team member

Cohesion:

". . . in Sri Lanka they know each other very well. There's a cultural difference. They, they do a lot of things together. Generally speaking, they are a little younger, many who come directly from school come here. It's their gang of friends. They make things up on weekends. Then they have these... a lot of activities, including a weekend they go away the whole family and do things and have parties... Then there's a cultural difference. Weddings in Sri Lanka, then the whole office is involved, if there are deaths in the family, the whole office is there. So, if someone whose parents pass away, then the office is empty. In that way, they know each other, locally. And in Sweden we don't. We don't kind of hang out outside of work more

than for an after-work, sometimes... The cohesion of Sri Lanka has always been very good. Group managers have expressed that the team members may be too good mates, in that they tend to not disagree at all in discussions."

Respondent 2, senior manager

"... yes, we go for dinner or lunch. So yeah, we meet on weekends as well. We Yeah, we play cricket or badminton... So yeah, we knew each other pretty well... "

Respondent 23, team member

Culture:

"... Personally, I'm, I'm more like, I'm very flexible. So, I usually, you know, I try to understand the other person's viewpoint and adjust as needed, and work. So, culture has not been a big problem for me. And throughout the working experience as well, I haven't seen any place where culture has become a problem... "

Respondent 12, team member

"... like in general, the farther is the culture you're working with, the more difficult. So of course, like it was easier to communicate and collaborate within Europe rather than Europe-India... Well, a typical Swiss is like ... both Swiss and Swedish is working on consensus. And in Sweden, it's probably even more... And on the opposite side, I can tell you that a typical Italian, but also like Latin cultures in general, is hier... how to say? There is an hiercha... (hierarchy)"

Respondent 17, manager

4.21 Knowledge and knowledge sharing

All respondents (22/25, three empty answers) believed they had enough knowledge to do a good job, except for one manager and one team member, who argued that they were always looking for more knowledge, never being satisfied. Almost all respondents, except for two members (23/25), believed that other team members had all the necessary competence, and one team member thought that not all team members did their job the best way. They all (21/25, four empty answers) shared their knowledge without fear of others profiting from their knowledge, and all respondents (20/25, four empty answers) save one team member felt that it was appreciated when knowledge was shared with the others. However, there are also times when knowledge sharing wasn't always easy or appreciated.

Knowledge:

"I would like to think so. And as a software engineer, if I'm presented with an issue, I don't have the knowledge, I think I, if it's possible, I have to search a data feed something books or whatever, and get that knowledge. If not, I have to flick this with my line managers to get a knowledge transfer. But there has been time there have been several times. I had to learn it on the go on my own."

Respondent 11, team member

"... I believe, yes. But of course, there is room for improvement. But I am confident about the job I'm doing and the results I produced. I'm happy and proud about that. So, I believe I have the not enough knowledge. And also, I believe there's room for improvement."

Respondent 12, team member

Knowledge sharing:

"Yes, yes. I mean, here we have a knowledge sharing sessions every month. So, people who every month they present what the work they're doing to whole team Oh, yeah. I mean, once I'm done with my project, I will share with my team, the findings, I'll explain about the project, my contribution. So, this happens during knowledge-sharing sessions]"

Respondent 23, team member

"... In my opinion, I'm trying to share the knowledge. But I think mainly with the time pressure and because of the distributed nature, it's really hard to transfer the knowledge... And

sometimes even the, the newcomers, they won't, they don't want to get the full picture instead of they will try to get the, get, try to get the answer for the specific question and finish it off. So, if I'm there, or if they are here, then it won't be like that and then we can discuss and we can give more knowledge. That's how I'm thinking."

Respondent 7, team member

4.22 Work quality and workflow

All participants (24/25, one empty answer) felt that they contributed to the team's work, and all (n 23/25, one empty answer) but one senior manager was proud of their job. Workflow was also reported by one senior manager (n 1/3), five managers (n 5/7) and twelve team members (12/15, one empty answer). Among those who experienced flow, a great majority experienced flow several times a week or more; i.e., two senior managers (2/3, one empty answer), four managers (4/7), and eleven team members (11/15, one empty answer).

Work quality:

"..it's, as a job every year, I learn. I never stop learning, where some people they go in, they do their job they leave that kind of doesn't happen in this industry"... "I think I also think I'm lucky to have a job I can fit around my family"... That's all quality. And that's really important..."

Respondent 5, manager

"...And we have the flexibility to choose the means within the projects not on the top level means whatever the work, we are assigned, in that we have a little flexibility to be means that we are responsible for our planning. So we have flexibility to choose what to do first and that it's not like that. It is mandatory. Related duties were listing and listing. So, we are fully responsible for that or maybe like we through discussion we come to know the priority it is chemists' work-life balance wise I can say how we can able to take us. So as it is, [Company B] is a company, European-based company. So, we get good work life balance here..."

Respondent 24, team member

Work flow:

"Yes, I can do that. Rarely, but I know the feeling..."

Respondent 2, senior manager

"Yeah. All the time."

Respondent 5, manager

"...Yes. It's fun and we are used to do the work in a certain manner, right? And I'm enjoying it, right? When a change is needed, we do the change to improve the productivity and the efficiency...like we did the self-selection and the forming of teams based on the product areas... It's an initiative from (senior management) and the products management team..."

Respondent 13, manager

"...I would say, yeah, most of the time, I'm actually happy working with what I'm doing. Because I actually want to be an electrical engineer, I want to work in the same area, my engineering field. I see most of the people who has electrical background working in software. But for me, I want to work in the same area. So, working with [Company B], it is really good. I mean, I would say most of the time. I'm enjoying what I'm doing. I'm taking this as a passion, and I'm working. Yeah, but sometimes I feel I mean, sometimes I feel a little bit like that. But most of the time, I will say, I'm happy with what I'm doing..."

Respondent 23, team member

4.23 Management and leadership

Regarding management and leadership, all respondents (23/25, two empty answers), except for senior management (3/3) agree that management and leadership work well. However, the interviews show a slightly different picture of how management affects practical work.

Management and leadership:

"... I think we don't, we don't value the time upfront of really understanding what we're trying to achieve. I think how we actually do the work, I like the process. I think it works, how we plan using story points. And then we've got user stories, and then we take, like we do them, and then we test them and everything. But the upfront how we actually make sure we really, really get it even if we have to hear it three times, actually really understanding what we're trying to achieve. Because requirements can be misunderstood. They can mean different things to different people. Unless we all keep talking about it, you don't know I had one project where I thought the requirement was very obvious and straightforward. But still someone interpreted it slightly different. So, unless you keep talking, you don't know that actually that person has a different view, because we all see things in different ways. And I don't think we spend enough time actually talking it through so that you know that every single team member maybe at different times. So the beginning you only have certain people, but then it's essential that every team really understand that story of what we're trying to achieve... I don't think you need a lot of time. You need to focus."

Respondent 5, manager

"... as I said, we are multi-project, let's say. I do have a similar project on my desk today. And indeed, every pm believes that his project is the most important one. So, in that aspects it's not easy. But my manager ... That's only one guy. That's only him. That's the one I know. And sometimes there are new things coming up. So the priority have been changing all the time... More and more those days. And people believe that because they did address an email with question, that means the problem is solved. Because the problem is not anymore on their desk. It's on my desk... But they do not understand that I do have plenty of those problems popping up in my emails every day. And I'm always disturbed..."

Respondent 19, team member

4.24 Conflicts

Of the respondents in this study (N =25), one manager (1/7) assessed that conflicts are normal in teams, and six team members agreed on that (6/15, one empty answer). The reasons behind conflicts vary, but all agreed that the main reason was different personalities (7/7), poor preparation, poor collaboration, difficulties in decision-making (4/7), lack of trust (n 3/7), and lack of education in group dynamics, lack of resources, lack of relationship and lack of cohesion (2/7). However, in the event of conflicts, most of the management (2/3), all managers (6/7, one empty answer), and eight team members (8/15, one empty answer) felt they knew how to solve a conflict.

Conflict:

"... I won't say it's a conflict, I will say it's more of a gap of the sense sometimes we may not get the complete information. Sometimes we may not get what exactly or every information, we want to perform the worker perform the task. Right. So, in that way, I see as a more of a gap. But the conflict-wise, I don't see as a conflict because we have a freedom to discuss. And we have a freedom to express our ideas and our approaches. During the discussion, if it is a technical or if it is a non-technical, then if our ideas and our approaches we want to practice then we always get support from the stakeholder from other sites. So mostly more than 95% or 99% we generally don't land up in any conflict..."

Respondent 22, manager

"... Conflict means every time we gather for problem-solving, maybe it's technically functional. People throw their ideas and opinions, there are conflicts on ideas and opinions. But it ends up in a good way. But there are no personal conflicts which I have experienced, only a technical or functional [one] that is operation."

Respondent 10, team member

4.25 Use of technical devices enabling informal meetings?

As noted in prior research, there have been several attempts to bridge remote employees together through technology, such as open areas with large video screens for non-scheduled informal meetings used for, for example, virtual coffee places. Therefore, expect to gain knowledge of factors enabling global innovation teamwork, respondents were asked whether they were familiar with such equipment and if they would use it if it was available. One of the respondents (1/25) had heard about such equipment, and all but two participants (2/25) were positive about using it or at least trying it out if available. There were some concerns, though:

> *"It would be great to try such a variant out"*
>
> *Respondent 2, senior manager*
>
> *"Personally, yes, I think that'd be interesting. At least to try it out, but like, eeeh. I'm not sure how comfortable people will be. I mean, we don't really talk a lot about the work stuff during tea time... So, I'm not sure how comfortable people will be to switch to English so that everybody understands each other. But especially because it's sort of the free time, but I don't know, I think it's sounds interesting, and I try it out..."*
>
> *Respondent 11, team member*
>
> *"I don't think so (use virtual coffee place), because... you know, where we do have our coffee place, it's a meeting place for all kinds of people of all kinds of teams."*
>
> *Respondent 16, team member*

4.26 Creating gHIT – insights and guidelines

An innovation team is, as defined, a team created purposefully to innovate. Such teams are, therefore, based on people fit for the assignment. High-performing innovation teams are suggested to be multifunctional teams comprised of entrepreneurial and knowledgeable people within each member's area of competence, which also can handle the innovation process and group development processes in practice. gHIT is the next level, where the team member cannot meet in person and are geographically dispersed. To visualize that scenario, a conceptual model, the gHIT-model, was developed (Figure 4). The gHIT-model consists of four areas—the global, organisational, team, and team member perspectives. Each global innovation enabler identified in this research is demonstrated and organised into these areas. Also, the gHIT-model highlights that education on the global innovation enables innovation management practices, and the group development process is recommended in each of the four areas. Further, the gHIT-model points out that members are limited by their geographical and technological boundaries and can only meet other team members through the use of technical equipment.

As seen in the group development process, conflicts occurring as the team is created are common. Innovation performance-related problems often are related to a lack of knowledge, which takes time and energy to sort out. Therefore, to shorten the time needed to develop a gHIT, the aspects mentioned are primed simultaneously as the team is created, from holistic to specific education. Using the gHIT-model as a base and building on the structure from Figure 1, a process and guidelines, the gHIT-process suggests how to support the creation of gHITs in practice was developed on a conceptual level (Figure 5), consisting of five steps:

First, when creating a gHIT, this means understanding that there are certain aspects to consider. gHIT members cannot meet or interact with each other than through technology. Further, cultural factors may affect decision- and sense-making, and time zones affect the time for meetings and work overall. Management for a gHIT should be adjusted accordingly, meaning that the innovation team should have one manager to report to, preferably not middle management on each location filtering the information for the individual team members or potentially hindering a team member from conducting whatever task is needed according to whatever the chosen innovation process suggests. Also, from an innovation management and group development perspective, the work differs from co-located work, because the team members may have to work alone and have problems interacting or communicating with the other team members. What brings the team together is technology. Therefore, as the gHIT is created, the technology must be carefully chosen to match what is expected. The importance of appropriate technology cannot be underestimated.

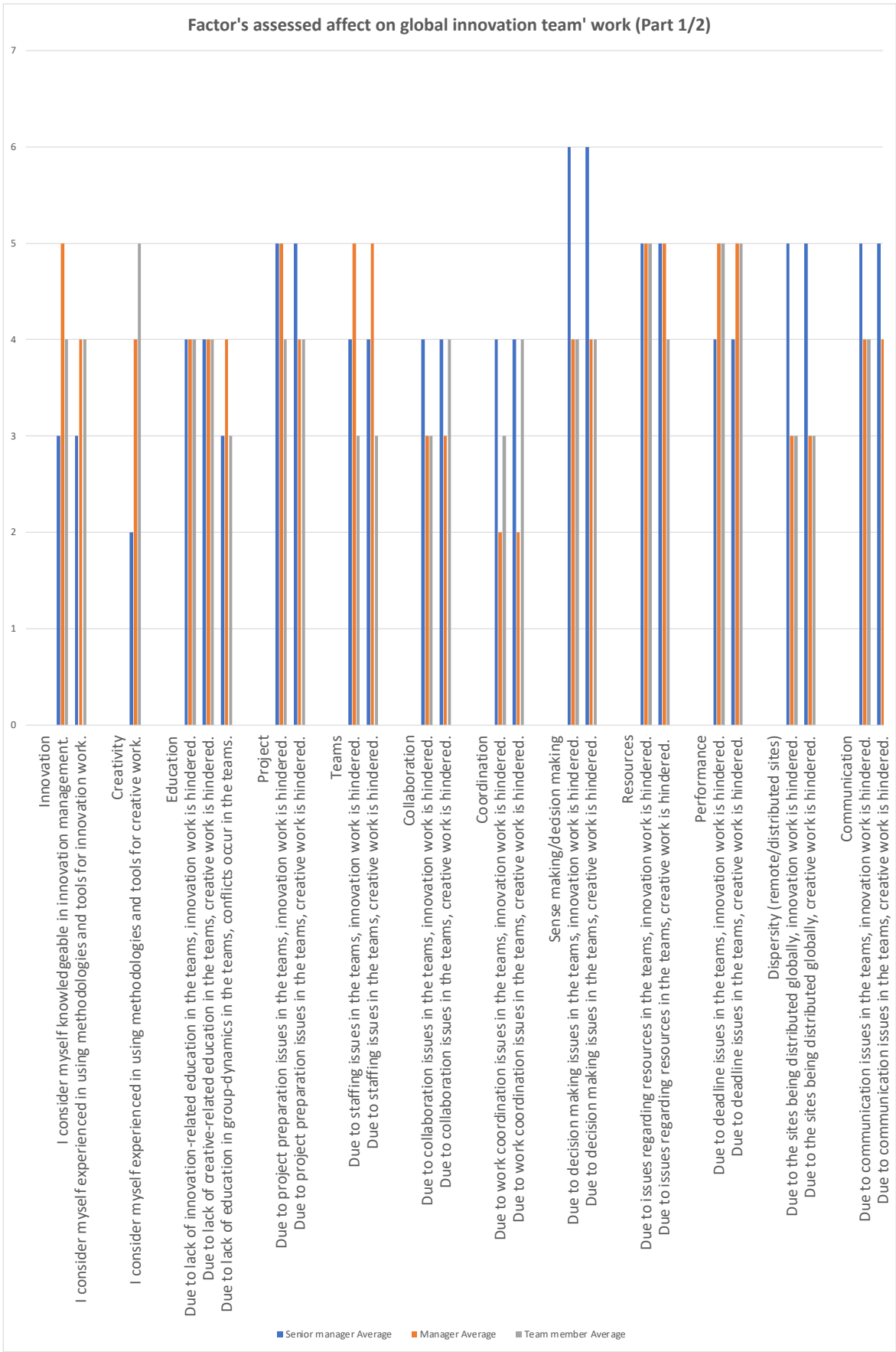

Figure 2. Factors' assessed effect on global innovation teams. work, part 1/2

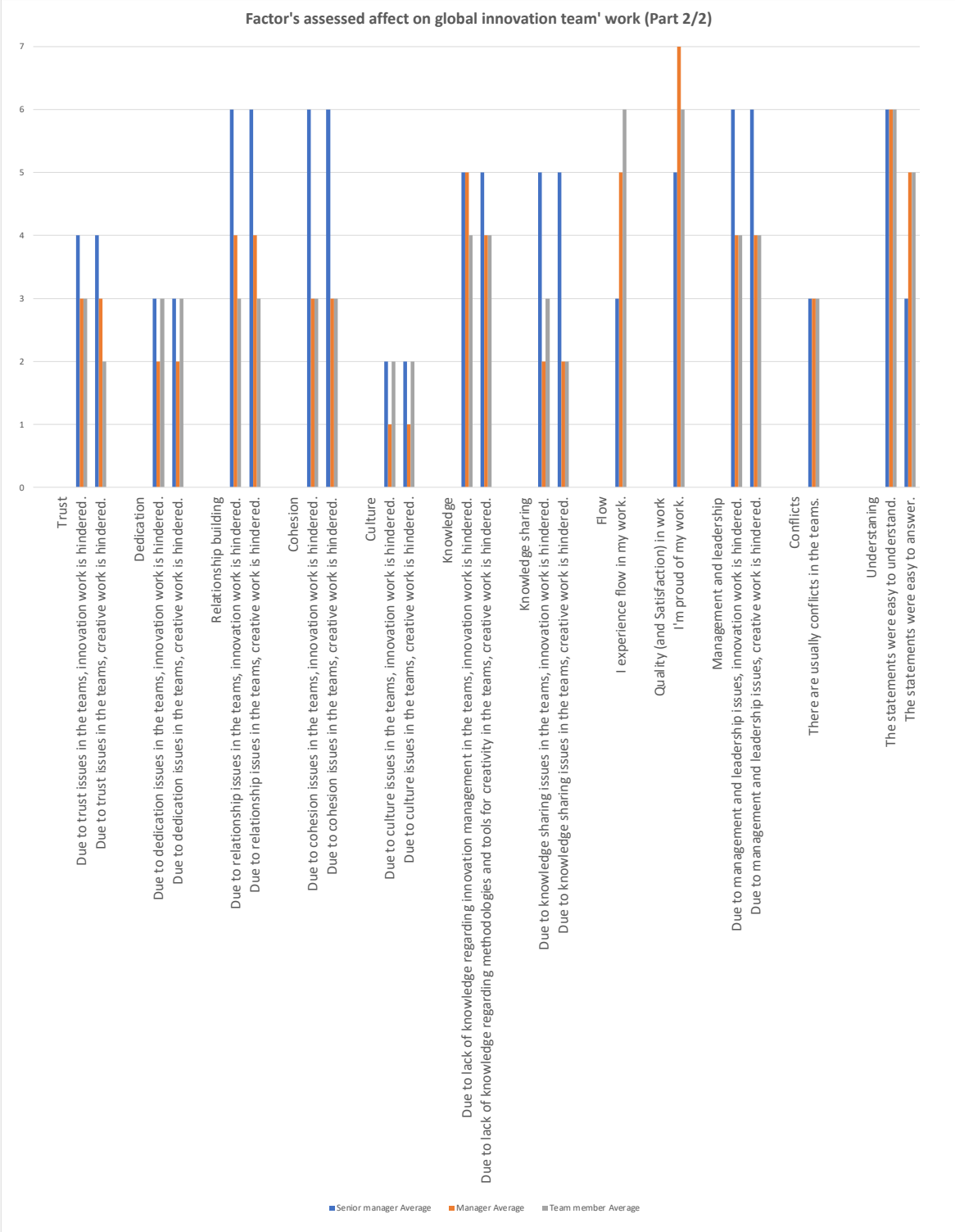

Figure 3. Factors' assessed effect on global innovation teams' work, part 2/2.

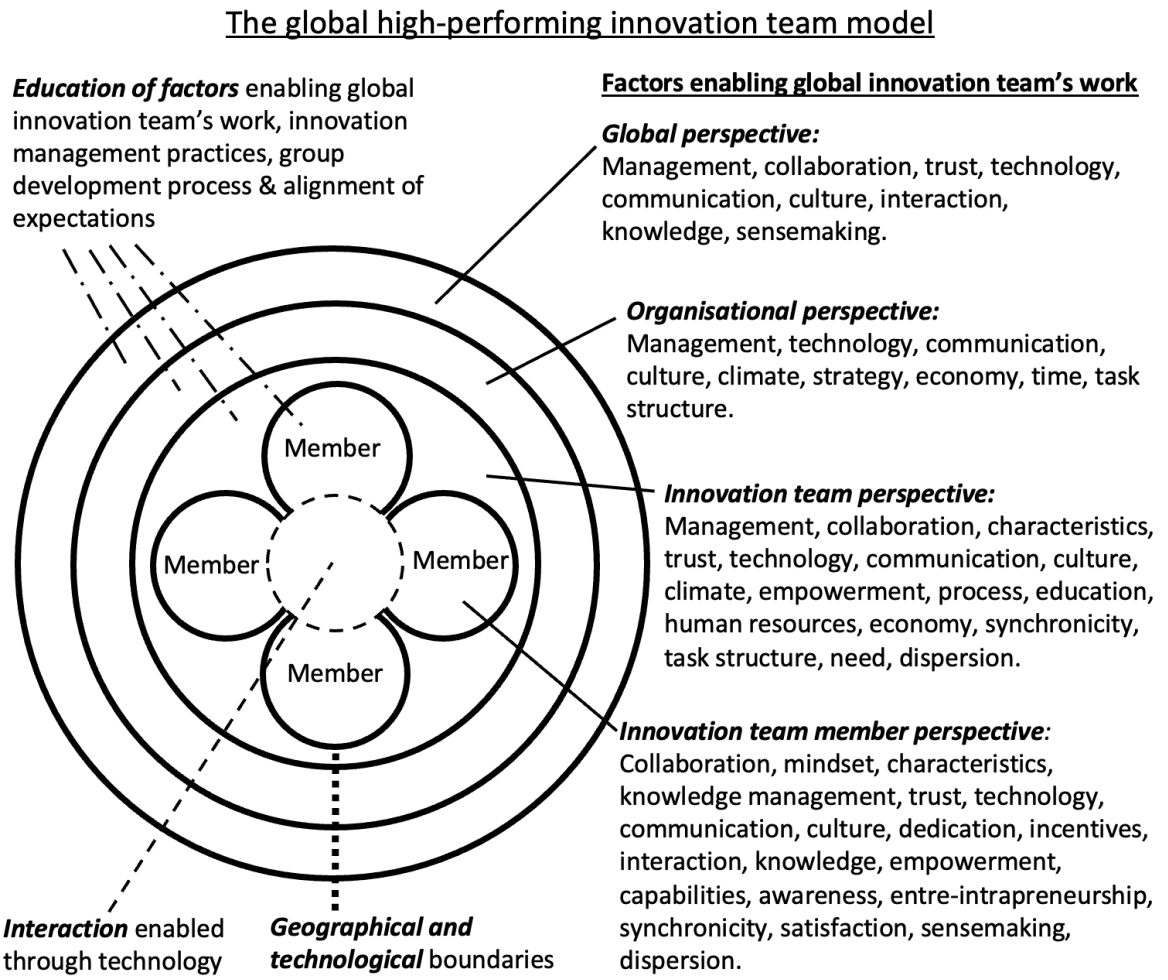

Figure 4. A conceptual model of gHIT: the gHIT-model. The figure illustrates the relation between global-, organisational-, team-, and team member perspective, and the global innovation enablers and education in each area. It also shows team members isolated and their dependency on technology.

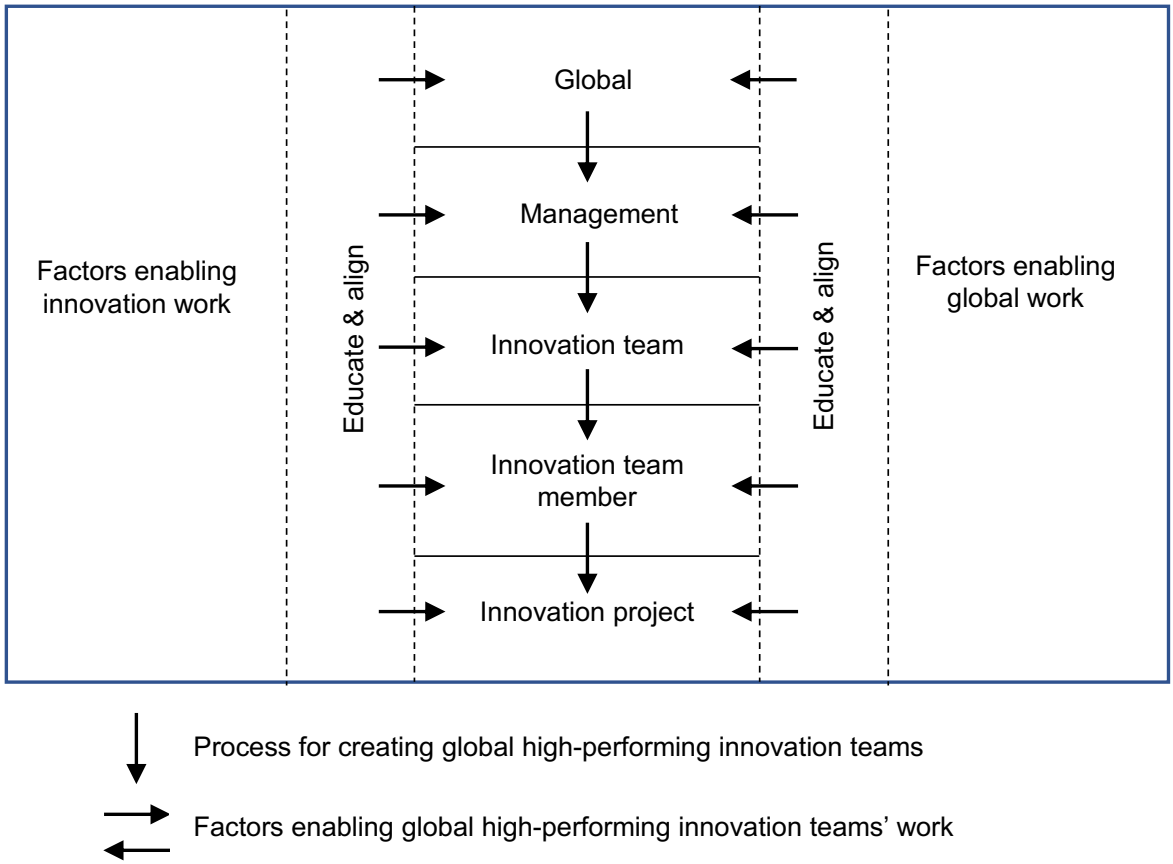

Figure 5. A conceptual process of the gHIT-process. The figure illustrates a top-down approach to creating gHITs (horizontal arrows) and global innovation enablers (vertical arrows) through a systematic process.

To bring knowledge on these aspects, education regarding factors enabling global innovation team's work should be brought to not only potentially directly involved managers and team members but also broadly to managers and co-workers to establish an overall understanding that the work of gHITs differs from co-located innovation team's work, and must therefore be treated differently. Also, education on innovation management practices should be provided broadly to ease managers' understanding of how to support resources and for co-workers to participate in the various phases of the innovation process. Further, the group development process should be addressed to help detect potential problems before they become a problem. Understanding what triggers problems and being aware of signals and symptoms for potential problems, would ease the development of a newly created global innovation team in their progress to becoming high-performing;

Second, more specific education for managers involved in a particular innovation project is suggested. On a holistic level, managers must commit to the forthcoming innovation work conducted by a global team, which might be challenging regarding the lack of control it brings. Genuinely understanding the factors enabling gHIT's work eases the planning and properly follow-up on the forthcoming innovation work without hindering it. It also eases evaluating the current work climate and work culture, and by doing so, identifies related potential conflicts. Further, planning for an innovation project also requires resources in terms of the finances available to spend on the project and time available for the forthcoming team members, and to set up proper technology enabling communication and developing a structure for shared leadership in the forthcoming innovation team. Further, the technology also enables the gHIT to collaborate and build trust and cohesion. Education on innovation management practices aims to provide an understanding of agile innovation work, innovation work tools and methods, and to plan resources accordingly. Regarding the group development process, education is about building capabilities to observe potential problems, prevent potential issues in advance, and be ready to act to help a team having problems. Also, management should allocate resources for educating the forthcoming team on the chosen technology.

Third, on a team level, education is suggested regarding how best to organise the team to succeed with shared leadership and empowerment, how to establish a fruitful and honest working climate and culture, how to connect with colleagues at other departments, and how to plan budgets and task structures. Additionally, handling the dispersion of team members and identifying technology that fits not only the project but also encourages communication and supports the establishment of a stimulating climate, relationship-building, and cohesion. To create a gHIT driven by shared leadership, it should be small and staffed accordingly. A small multifunctional team of about 4–6 is suggested to enable effectiveness and avoid conflicts and social loafing. As such, its team members should be invited based on their competence and ability to handle the factors identified in Figure 4. A dedicated person acting as convener is suggested to accomplish that task; someone who can gather a team based on the challenge that needs solving. The convener is not a project leader but a person establishing the team, encouraging shared leadership, and securing the communication channel between management and the team. Education on innovation management refers to practical tools such as needs verification, idea creation and evaluation, implementation, and value capture. Also, the group development process should be a topic of education, as should the recruitment of team members.

Forth, as the team members are recruited based on the direction of the innovation project, they are educated by the convener (as they were educated) on global innovation enablers, innovation management practices, and the group development process. Also, the proposed team member's managers are asked for their commitment to the innovation project to secure the resource (team member) in mind.

Fifth, the innovation project is set to take off, beginning with a virtual kick-off. At the kick-off, the work is not only in establishing norms and ways of working. It also focuses on developing trust, building relationships, communicating and discussing the need for technological tools, and beginning an in-depth education of global innovation enablers and practical innovation management tools. What differentiates a gHIT from a co-located innovation team is that the gHIT also must agree on how to communicate through the technology equipment, when to meet, as various time zones may be a challenge, and how to learn different cultural aspects and utilise them in the project.

As part of the stepwise education (as suggested above), alignment of expectations and understanding of the global innovation enablers among the senior management, management, and team members is central, as they assessed the same situation differently. Therefore, in each step of the education, it is suggested that a specific focus on the other groups is considered to build a common, united understanding of the other

groups' expectations of the forthcoming work. By understanding others' concerns, challenges, priorities, etcetera, it is likely to expect fewer problems and better performance.

5 Discussion and conclusions

This research has resulted in new knowledge supporting global companies that aim to create gHITs. Two main findings were identified: the gHIT-model, which demonstrates how the dispersed team members are dependent on technology for their work and the global innovation enablers that are affecting the work from a global, organisational, team, and team member perspective; and the gHIT-process, which contains a model and guidelines on how to create such teams. I found no equivalent research and therefore argue originality.

5.1 Theoretical implications

Research on gHIT is a complex area that involves several research fields; more specifically, group development, innovation management, virtual and global work, and innovation teams. They all contribute valuable knowledge to the complex area mentioned that are sometimes overlapping and intertwined. In the following I discussion the findings and contribution to previous research.

5.2 Systematic literature review

Systematic literature reviews on global innovation enablers from a holistic perspective are rare. Instead, a scattered area can be found, focusing on, for example, innovation climate (Newman et al., 2020), trust (Cheng et al., 2021), and e-leadership (Contreras et al., 2020). However, a few articles bring an overview of parts of the topic, more specifically, virtual teams (Ebrahim et al., 2009; Gibbs et al., 2017b; Clark et al., 2019), global virtual teams (Scott & Wildman, 2015), and innovation teams (Johnsson, 2017b). In this research, additional enablers were identified, Further, in contrast to prior research on the topic, the proposed gHIT-model provides a holistic understanding of what global innovation enablers are affecting the gHIT from the global, organisation, team, and team member perspective. It also clearly illustrates that the team members are isolated and cannot meet without technical equipment. Furthermore, through empirical data, the proposed gHIT-process provides guidelines highlighting the importance of systematic education of the identified global innovation enablers as part of preparing and planning for a gHIT. Training and education of teams are also found in prior research (Klitmøller and Lauring, 2013; Ebrahim, 2015; Ford et al., 2017; Clark et al., 2019), but not as preparation for forthcoming gHITs nor on global innovation enablers. To add additional value to prior research, the gHIT-process is also illustrated to show the different perspectives of innovation and global aspects, and how these are educated through a top-down approach.

5.3 Creating global high-performing teams

In the previous research on group development, frameworks and models have continuously been developed explaining how groups of people develop into effective teams (Tuckman, 1965; Rubin et al., 1977; Tuckman and Jensen, 1977; Katzenback and Smith, 1993; Lombardo and Eichinger, 1995; LaFasto and Larson, 2001; Lencioni, 2002; Hackman, 2002; Wheelan et al., 2020). Stepwise, they have built new knowledge and concluded the importance of collaboration, and in building trust, team leadership, and culture as part of a group's progress towards a potentially effective team. Also, making people accountable was a vital ingredient in supporting dysfunctional teams. It is essential to highlight that the developed models focused on explaining phenomena, factors, and characteristics as instruments for team effectiveness and not how to avoid group dynamic problems before they occur. On the other hand, Wheelan et al. (2020) developed quite a few tools to detect and support emerging groups and teams, and leaders for groups and teams in trouble. This research contributes the global perspective through the gHIT model, providing a bigger picture of the group development approach and that teams can be created and educated systematically through the gHIT process to be prepared for innovation work and potential upcoming group dynamic problems.

Regarding the previous literature on innovation teams, frameworks and models have been developed to understand work groups (Zuidema & Kleiner, 1994) and team innovation (Thayer et al., 2018). Also, processes have been developed to consider the cultural aspects of global product development teams

(Sivakumar & Nakata, 2003), how to create innovative teams (West et al., 2004; McGreevy, 2006a, 2006b) and high-performing innovation teams (Johnsson, 2017a). Even though they propose specific top-down processes to build innovative or innovation teams, and Johnsson (2017b) suggests that the group development process must be addressed when a high-performing innovation team is created, none of them considers the holistic picture; for example, that the team members are isolated from each other or that accessible technology is the one tool that enables the team to function. Furthermore, they even propose physical kick-offs as the official starting point for a new project. Again, the global perspective is not considered, nor is the aspect of education of global innovation enablers to prepare for the upcoming work, which this research suggests through the gHIT-model and gHIT-process.

From the virtual and global perspective, previous and recent research proposes frameworks, models, and processes to create virtual teams (Hertel et al., 2005), global virtual teams, effective virtual teams (Lin et al., 2008; Ford et al., 2017), effective virtual R&D teams (Ebrahim, 2015), (often) high-performing global innovation teams (Osgood, 2012), global virtual teams (Derven, 2016), and high-performing research teams (Cheruvelil et al., 2014). Here, interestingly, Hertel et al. (2005) propose a physical kick-off and Osgood (2012) proposes that most of the core collaboration network should be located onsite. Both Derven (2016) and Cheruvelil et al. (2014) point out the forming–storming–norming–performing phases are part of a group's ordinary development, where Cheruvelil et al., (2014) even state that it is a necessary step to take to become a high-performance research team. On the other hand, Ford et al. (2017) suggest onboarding and training in collaboration and preparation for different cultures. Notably, though, is that they claim innovation work is difficult for virtual teams. In the gHIT-process, education on innovation management practices are part of the core content, which adds perspective to Ford et al.'s (2017) concern. Furthermore, the preparation of management and team members before an innovation project and a virtual kick-off adds perspective to the expressed need for dispersed team members to meet in person (Hertel et al., 2005; Derven, 2016) or at least work close to the core collaboration network (Osgood, 2012). Except for Osgood (2012), prior research on virtual and global teams does not consider the innovation perspective, while he, on the other hand, focuses less on the creation process of the innovation teams. Therefore, the proposed gHIT-process adds perspective on these aspects as well.

Education

According to the results of this study, education on the identified global innovation enablers and innovation management practices is required for multiple reasons. Previous research has shown that education is needed, for example, in language training and language policies to achieve effective communication (Klitmøller & Lauring, 2013), cross-cultural collaboration and agreement (Duus & Cooray, 2014) and use of technical equipment (Ebrahim, 2015). Moreover, previous research on the work of virtual teams has also revealed numerous communication tools (Törlind and Larsson, 2002; Fruchter and Bosch-Sijtsema, 2011) and their benefits and obstacles (Han et al., 2017). In this study, the need for education on communication refers to understanding the effects of different ways of communication and developing new routines and norms on how to use technology. For example, all the participants knew that using the camera during meetings increases the sense of presence and attendance, as recommended by Olson et al. (2014), which indicates that the challenge of meetings goes beyond the technology itself but more on understanding how to utilise it by developing routines to want to, for example, meet and build relationships.

Furthermore, Ford et al. (2017) suggested that team leaders should receive training in virtual leadership and that team members should be chosen depending on their ability to work in a distributed manner on a virtual basis, aside from being educated in group collaboration. In their suggestions regarding building effective virtual teams, they considered trust to be as the key factor established through education, shared leadership, and communication between team leaders and team members. Although my findings do not disagree with those findings, in this study, there were no trust or cultural issues hindering innovation work to a large extent, even though these two factors were mentioned as problematic areas to some degree during the interviews. However, the data indicated that communication and leadership can be improved. The data also indicated poor performance, as the participants agreed that the scopes were reduced in ongoing projects to meet the deadlines.

In contrast to the findings of Ford et al. (2017), Johnsson (2017b) suggested a stepwise process to create high-performing innovation teams. However, although Johnsson suggests brief education on innovation management and group-dynamic processes and suggests an approach similar to that of Ford et

al. regarding, for example, shared leadership, which team members to invite, and the establishment of trust between team members, Johnsson did not consider the global nor the virtual aspects. This study also shows that, despite education on innovation management tools, participants lacked the knowledge and experience necessary to use them on their own, as they were assessed as too complicated. Therefore, brief education on innovation management and related tools is insufficient. Hence, in-depth education through both theory and training in practice is proposed. In case the forthcoming innovation team is inexperienced, Johnsson further suggests that an internal or external innovation facilitator should be engaged to support practical work. In this study, data confirmed the need for a knowledgeable individual to support a global innovation team. Although around half of the participants considered themselves knowledgeable in innovation, a minority considered themselves knowledgeable enough to conduct practical innovation work.

Alignment

In this study, the data indicate that the perspectives behind what factors hinder innovation are not aligned among the three groups. All the areas investigated in this study, except for three (dedication, culture, and conflicts), had room for improvement (Figure 3 and Figure 4). Even though cultural problems and conflicts were mentioned among the respondents, they were not considered to hinder innovation work overall. Following this, according to the data collected, projects are usually insufficiently prepared for innovation work, sense-making is problematic for teams, many teams lack recourses, the level of communication is insufficient, and team members lack cohesion and do not work on relationship-building to a sufficient level. Senior management also recognised that they and the teams do not have sufficient knowledge in innovation management, and that management and leadership hinder innovation work. Generally speaking, managers and team members assess situations quite the same. In their opinion, they assess fewer areas hindering innovation work than what senior management does. In addition to what senior management finds to be positive, they also believe that collaboration, coordination of work tasks and dispersity do not cause any significant problems for innovation work. Further, in this study, trust, cohesion, and knowledge-sharing do not hinder innovation work. However, managers assessed that projects are usually not prepared for innovation work and that deadlines and the lack of knowledge in innovation management hinder innovation work. What mainly separates managers' assessment from team members is that managers perceive staffing issues and relationship building to hinder innovation work, while team members do not.

In this study, senior managers showed higher expectations regarding innovation output than managers and team members. During the interviews, senior managers expressed the need for more frequent use of innovation and creativity tools, hoping for more innovative solutions. In contrast, managers and team members seemed to attempt to solve problems handed to them without focusing too much on the innovation aspects. Although nearly half of the team members stated that they spent enough time understanding the problem at hand; the rest, in addition to senior managers and most other managers, agreed that this was not the case. They do not generally have access to end customers. Meaning, with a few exceptions, the tools used for creating innovative solutions were not utilised, which is explained by the lack of knowledge on how to use such tools and the fact that time limitations in projects hinder innovation work.

Therefore, to overcome the identified problems, it is important that senior management and management of gHITs pave the way for innovation by setting the conditions for infrastructure, in terms of both technical and collaboration aspects and recourses. It should also be pointed out that managers are in the position to take a direction for innovation work and set reasonable expectations and goals. If innovative outcomes are to be obtained, each project must be planned appropriately, which means that team members need time and accurate knowledge to prepare for and conduct practical innovation work.

In previous research on virtual and global innovation teams, alignment is also a central aspect to consider. Precisely, work processes to enable, for example, knowledge sharing (Ebrahim, 2015; Ebrahim et al., 2009b), cultures (Ebrahim et al., 2009a) and factors related to the involved people (mission, network, manner, leadership, structure, multitasking, interdependence, values, and diversity) are the most prioritised (Osgood, 2012) to align. What mainly differ their research from this study, is that they suggest alignment of already established teams. Therefore, the proposed gHIT-model and gHIT process contribute knowledge, as they include alignment as part of the global high-performing innovation team creation process.

5.4 Practical implications

For managers, practitioners, and academics, this research contributes valuable insights. For managers, understanding that resources can be spent on value-creation activities rather than on rescue missions for newly-created innovation teams in trouble should be of interest. This research shows us that innovation work will likely be hindered if the global innovation enablers are not considered. To avoid that, this research suggests that an investment in education and alignment of expectations would increase the chances of successfully creating gHIT, where the gHIT-model and the guideline can serve as the base. Practitioners can use this research to develop educational programs for their clients, which probably involve management, innovation leaders, and becoming gHIT members. By using the findings, practitioners can develop, for example, lectures, seminars, and workshops for educational purposes. Also, practitioners can use this research to support their clients' planning and creating of gHIT or activities themselves. Academics, similar to practitioners, can utilise this research to educate students in innovation management through, for example, complete courses including lecturers, workshops, and student projects, or as additional educational activities in other courses. It would potentially provide increased knowledge about the different perspectives of innovation teams and the complexity of creating them, which they, in turn, can use in their future career.

5.5 Conclusions

In this research, I have explored how to support the creation of global high-performing innovation teams (gHIT). I have reviewed the research field surrounding factors affecting virtual, global and innovation teams and how prior research suggests such teams are created. I also investigated how to create virtual, global and innovation teams. Guided by the theoretical background, I conducted a systematic literature review to create a holistic picture of factors enabling gHIT (global innovation enablers). Furthermore, I collected empirical data from senior management, management, and team members involved in global innovation work to investigate whether the lack of these factors was assessed to hinder innovation work. On the basis of the analysed data, two proposals connected to each other were suggested to bridge the gap in understanding how to create gHITs. First, the gHIT model, an overall model demonstrating the gHIT and related global innovation enablers, used to provide a holistic illustration of the team's position in a global context, was developed (Figure 4). Second, the gHIT process, which contains a model and guidelines on how to create gHITs, was developed (Figure 5). The guideline suggests stepwise education and alignment of expectations through a top-down approach. The findings add knowledge to previous research on group development, and virtual- global-, and innovation teams. Inspired by this research, practitioners and teachers of innovation management can develop educational programs, educate managers and innovation teams, and prepare them for global innovation work or educate students to master the knowledge theoretically and practically.

5.6 Limitations and future research

The suggested gHIT-model and gHIT-process are based on a systematic literature review and empirical data, systematically developed to support the creation of gHIT to meet the need for innovation work by teams distributed globally. The empirical data covers the complete picture of a gHIT, including the manager, team, and team member perspective, which strengthens the suggested gHIT model and gHIT process. Also, the data is rich, including both an extensive questionnaire and in-depth interviews. On the other hand, the empirical data sample is limited in the number of participants. Although relevant research on group development, virtual-, global-, and innovation teams, and empirical data in the area was used in this research, there are limitations to highlight. The gHIT-model and the gHIT-process are conceptually developed and therefore need further investigation. Due to the fairly complex content of the gHIT model and the gHIT process, it would require a knowledgeable person to implement them in an organisation, which on the other hand, is a competitive advantage for those who can understand and make use of it. The limitations, on the other hand, lays the ground for further research. Several research avenues are detected:

- The proposed gHIT model and gHIT process could be further evaluated by, for example, further systematic literature reviews, potentially resulting in revised models and or processes.
- As part of the gHIT model and the gHIT process, global innovation enablers could be further evaluated through case studies by studying, for example, their impact or effect on ongoing innovation projects. Such research would potentially result in, for example, new methodologies suggesting what global innovation enablers are most critical for different situations or phases in the innovation work.

- The proposed gHIT process could be evaluated through case studies, where gHITs are created in practice, to evaluate, for example, success factors and problems as gHITs are created. This would probably result in, for example, a revised and more robust and detailed gHIT process involving tools and frameworks.
- Based on suggested practical implications, develop and empirically evaluate educational programs for academics, practitioners and clients (such as customers and students) on the content of the gHIT model and gHIT process to study, for example, learning outcomes. Such research would probably result in, for example, tools for education activities, training, and knowledge evaluation.

Acknowledgements

I'd like to thank the participating companies and Mälardalen University, which funded this research. Also, I'd like to thank the Co-Editor-in-Chief, Anne-Laure Mention, and the reviewers for all their support and valuable advice. Parts of this article have been published as a conference contribution: Johnsson, M. (2021). Factors enabling global innovation teams. In *The XXXII ISPIM Innovation Conference – Innovating Our Common Future*, Berlin, Germany, on 20–23 June 2021.

This work was supported by the the participating companies and Mälardalen University.

6 References

Adkins, L. (2010). *Coaching Agile Teams: A Companion for ScrumMasters, Agile Coaches, and Project Managers in Transition*. Courier.

Aldea, C. C., Popescu, A. D., & Draghici, A. (2012). Information and communication technologies support for building trust in virtual teams. *Managerial Challenges of the Contemporary Society*, *3*, 13–17. www.ecqa.org

Alge, B. J., Ballinger, G. A., & Green, S. G. (2004). Remote control: Predictors of Electronic Monitoring Intensity and Secrecy. *Personnel Psychology*, *57*(2).

Alsharo, M., Gregg, D., & Ramirez, R. (2017). Virtual team effectiveness: The role of knowledge sharing and trust. *Information and Management*, *54*(4), 479–490. https://doi.org/10.1016/j.im.2016.10.005

Bäckström, I., & Mosleh, W. S. (2021). The inclusive organisation: Management practices of Employee-Driven Innovation (EDI). *International Journal of Innovation Management*, *25*(6). https://doi.org/10.1142/S1363919621500687

Backström, T., & Olson, B. K. (2010). Kaikaku - a complement to emergence based development. *The First ICDC Conference*.

Backström, T., Wilhelmson, L., Åteg, M., Olson, B. K., & Moström Åberg, M. (2011). The Role of Manager in the Post-Industrial Work System. In E. Segelod, K. Berglund, E. Bjurström, E. Dahlquist, L. Hallén, & L. Johansson (Eds.), *Studies in industrial renewal* (pp. 215–227). Mälardalens högskola.

Balsamo, T. J., Goodrich, N. E., Lee, J. M., Morse, T. F., & Roberts, D. A. (2008). Identify your innovation enablers and inhibitors. *Industrial Research Institute*, 23–33.

Barczak, G., Griffin, A., & Kahn, K. B. (2009). PERSPECTIVE: Trends and Drivers of Success in NPD Practices: Results of the 2003 PDMA Best Practices Study. *Journal of Product Innovation Management*, *26*, 3–23.

Batarseh, F. S., Daspit, J. J., & Usher, J. M. (2018). The collaboration capability of global virtual teams: relationships with functional diversity, absorptive capacity, and innovation. *International Journal of Management Science and Engineering Management*, *13*(1), 1–10. https://doi.org/10.1080/17509653.2016.1275865

Batarseh, F. S., Usher, J. M., & Daspit, J. J. (2017a). Absorptive capacity in virtual teams: Examining the influence on diversity and innovation. *Journal of Knowledge Management*, *21*(6). https://doi.org/10.1108/JKM-06-2016-0221

Batarseh, F. S., Usher, J. M., & Daspit, J. J. (2017b). Collaboration capability in virtual teams: Examining the influence on diversity and innovation. *International Journal of Innovation Management*, *21*(4). https://doi.org/10.1142/S1363919617500347

Blessing, L. T. M., & Chakrabarti, A. (2009). DRM, a design research methodology. In *DRM, a Design Research Methodology*. Springer London. https://doi.org/10.1007/978-1-84882-587-1

Bosch-Sijtsema, P. M., & Haapamäki, J. (2014). Perceived enablers of 3D virtual environments for virtual team learning and innovation. *Computers in Human Behavior*, *37*, 395–401. https://doi.org/10.1016/j.chb.2014.04.035

Boyatzis, R. E. (1998). *Transforming Qualitative Information: Thematic analysis and code development*. Sage.

Breuer, C., Hüffmeier, J., & Hertel, G. (2016). Does trust matter more in virtual teams? A meta-analysis of trust and team effectiveness considering virtuality and documentation as moderators. *Journal of Applied Psychology*, *101*(8), 1151–1177. https://doi.org/10.1037/apl0000113

Brown, T. (2019). *Change by design, revised and updated*. HarperCollins Publishers, New York.

Castaneda, D. I., & Cuellar, S. (2020). Knowledge sharing and innovation: A systematic review. *Knowledge and Process Management*, *27*(3), 159–173. https://doi.org/10.1002/kpm.1637

Castellano, S., Davidson, P., & Khelladi, I. (2017). Creativity techniques to enhance knowledge transfer within global virtual teams in the context of knowledge-intensive enterprises. *Journal of Technology Transfer*, *42*(2), 253–266. https://doi.org/10.1007/s10961-016-9509-0

Charlier, S. D., Stewart, G. L., Greco, L. M., & Reeves, C. J. (2016). Emergent leadership in virtual teams: A multilevel investigation of individual communication and team dispersion antecedents. *Leadership Quarterly*, *27*(5), 745–764. https://doi.org/10.1016/j.leaqua.2016.05.002

Chatzi, S., Nikolaou, I., & Anderson, N. (2022). Team personality composition and team innovation implementation: The mediating role of team climate for innovation. *Applied Psychology*. https://doi.org/10.1111/apps.12408

Chen, M., Liou, Y., Wang, C. W., Fan, Y. W., & Chi, Y. P. J. (2007). TeamSpirit: Design, implementation, and evaluation of a Web-based group decision support system. *Decision Support Systems*, *43*(4), 1186–1202. https://doi.org/10.1016/j.dss.2005.07.008

Cheng, X., Bao, Y., Yu, X., & Shen, Y. (2021). Trust and Group Efficiency in Multinational Virtual Team Collaboration: A Longitudinal Study. *Group Decision and Negotiation*, *30*(3), 529–551. https://doi.org/10.1007/s10726-020-09722-x

Cheruvelil, K. S., Soranno, P. A., Weathers, K. C., Hanson, P. C., Goring, S. J., Filstrup, C. T., & Read, E. K. (2014). Creating and maintaining high-performing collaborative research teams: The importance of diversity and interpersonal skills. *Frontiers in Ecology and the Environment*, *12*(1), 31–38. https://doi.org/10.1890/130001

Chulvi, V., Mulet, E., Felip, F., & García-García, C. (2017). The effect of information and communication technologies on creativity in collaborative design. *Research in Engineering Design*, *28*(1), 7–23. https://doi.org/10.1007/s00163-016-0227-2

Clark, D. A. G., Marnewick A.L, & Marnewick C. (2019). Virtual Team Performance Factors: A Systematic Literature Review. *2019 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM)*.

Clark, R. E. (2003). Fostering the work motivation of individuals and teams. *Performance Improvement*, *42*(3), 21–29. https://doi.org/10.1002/pfi.4930420305

Cohen, S. G., & Bailey, D. E. (1997). What Makes Teams Work: Group Effectiveness Research from the Shop Floor to the Executive Suite. In *Journal of Management* (Vol. 23, Issue 3).

Contreras, F., Baykal, E., & Abid, G. (2020). E-Leadership and Teleworking in Times of COVID-19 and Beyond: What We Know and Where Do We Go. *Frontiers in Psychology*, *11*. https://doi.org/10.3389/fpsyg.2020.590271

Creasy, T., & Carnes, A. (2017). The effects of workplace bullying on team learning, innovation and project success as mediated through virtual and traditional team dynamics. *International Journal of Project Management*, *35*(6), 964–977. https://doi.org/10.1016/j.ijproman.2017.04.005

Czeisler, C. A., & Fryer, B. (2006). Sleep Deficit: The Performance Killer A Conversation with Charles A. Czeisler. *Harvard Business Review*. http://harvardbusinessonline.hbsp.harvard.edu/hbrsa/en/issue/0610/articl...http://www.hbsp.orgDIFFERENTVOICE

Dadriyansyah, G., Ibrahim, A., & Hassan, M. G. (2010). Virtual Integration as an Approach to Engender Product Innovation and Accelerate Product Development Time: A Literature Analysis. *17th International Conference on Industrial Engineering and Engineering Management : October 29-31, Xiamen, China*.

Daim, T. U., Ha, A., Reutiman, S., Hughes, B., Pathak, U., Bynum, W., & Bhatla, A. (2012). Exploring the communication breakdown in global virtual teams. *International Journal of Project Management*, *30*(2), 199–212. https://doi.org/10.1016/j.ijproman.2011.06.004

Darics, E. (2020). E-Leadership or "How to Be Boss in Instant Messaging?" The Role of Nonverbal Communication. *International Journal of Business Communication*, *57*(1), 3–29. https://doi.org/10.1177/2329488416685068

DeCusatis, C. (2008). Creating, growing and sustaining efficient innovation teams. *Creativity and Innovation Management*, *17*(2), 155–164. https://doi.org/10.1111/j.1467-8691.2008.00478.x

Dekker, D. M., Rutte, C. G., & Van den Berg, P. T. (2008). Cultural differences in the perception of critical interaction behaviors in global virtual teams. *International Journal of Intercultural Relations*, *32*(5), 441–452. https://doi.org/10.1016/j.ijintrel.2008.06.003

Derven, M. (2016). Four drivers to enhance global virtual teams. *Industrial and Commercial Training*, *48*(1), 1–8. https://doi.org/10.1108/ICT-08-2015-0056

Dew, R., & Hearn, G. (2009). A New Model of the Learning Process for Innovation Teams: Networked Nominal Pairs. *International Journal of Innovation Management*, *13*(4), 521–535. www.worldscientific.com

Dobni, C. B. (2006). The innovation blueprint. *Business Horizons*, *49*(4), 329–339. https://doi.org/10.1016/j.bushor.2005.12.001

Duus, R., & Cooray, M. (2014). Together We Innovate: Cross-Cultural Teamwork Through Virtual Platforms. *Journal of Marketing Education*, *36*(3), 244–257. https://doi.org/10.1177/0273475314535783

Ebrahim, N. A. (2015). Virtual R&D Teams: A New Model for Product Development. *International Journal of Innovation*, *3*(2), 01–27. https://doi.org/10.5585/iji.v3i2.43

Ebrahim, N. A., Ahmed, S., & Taha, Z. (2009a). Innovation and R&D Activities in Virtual Team. *European Journal of Scientific Research*, *34*(3), 297–307. http://ssrn.com/abstract=1501442http://www.eurojournals.com/ejsr.htm

Ebrahim, N. A., Ahmed, S., & Taha, Z. (2009b). Virtual Teams: a Literature Review. *Australian Journal of Basic and Applied Sciences*, *3*(3), 2653–2669. http://ssrn.com/abstract=1501443

Ebrahim, N. A., Ahmed, S., & Taha, Z. (2009c). Virtual Teams For New Product Development-An Innovative Experience For R&D Engineers. *European Journal of Educational Studies*, *1*(3). http://ssrn.com/abstract=1501445

Edmondson, A. C., & Nembhard, I. M. (2009). Product Development and Learning in Project Teams: The Challenges Are the Benefits. *Journal of Product Innovation Mangement*, *26*, 123–138.

Edmondson, A., & Nembhard, I. M. (2009). Product Development and Learning in Project Teams: The Challenges Are the Benefits. *Journal of Product Innovation Management*, *26*(2), 123–138.

Ekvall, G. (1996). Organizational climate for creativity and innovation. *European Journal of Work and Organizational Psychology*, *5*, 105–124.

Eubanks, D. L., Palanski, M., Olabisi, J., Joinson, A., & Dove, J. (2016). Team dynamics in virtual, partially distributed teams: Optimal role fulfillment. *Computers in Human Behavior*, *61*, 556–568. https://doi.org/10.1016/j.chb.2016.03.035

European Commission. (2018). *Oslo manual - the measurement of scientific and technological activities proposed guidelines for collecting and interpreting technological innovation data*. https://www.oecd.org/science/inno/2367614.pdf

Farris, G. F. (1972). The effect of individual roles on performance in innovative groups*. *R&D Management*, *3*(1), 23–28.

Fernandez, D. B. (2015). Virtual R&D Project Teams: From E-Leadership To Performance. In *The Journal of Applied Business Research* (Vol. 31, Issue 5).

Ford, R. C., Piccolo, R. F., & Ford, L. R. (2017). Strategies for building effective virtual teams: Trust is key. *Business Horizons*, *60*(1), 25–34. https://doi.org/10.1016/j.bushor.2016.08.009

Franz, T. M. (2012). *Dynamics and Team Interventions: Understanding and Improving Team Performance*. Wiley-Blackwell.

Fruchter, R., & Bosch-Sijtsema, P. (2011). The WALL: Participatory design workspace in support of creativity, collaboration, and socialization. *AI and Society*, *26*(3), 221–232. https://doi.org/10.1007/s00146-010-0307-1

Gajendran, R. S., & Joshi, A. (2012). Innovation in globally distributed teams: The role of lmx, communication frequency, and member influence on team decisions. *Journal of Applied Psychology*, *97*(6), 1252–1261. https://doi.org/10.1037/a0028958

Gibbs, J. L., Sivunen, A., & Boyraz, M. (2017a). Investigating the impacts of team type and design on virtual team processes. *Human Resource Management Review*, *27*(4), 590–603. https://doi.org/10.1016/j.hrmr.2016.12.006

Gibbs, J. L., Sivunen, A., & Boyraz, M. (2017b). Investigating the impacts of team type and design on virtual team processes. *Human Resource Management Review*, *27*(4), 590–603. https://doi.org/10.1016/j.hrmr.2016.12.006

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. In *Source: Administrative Science Quarterly* (Vol. 51, Issue 3). https://www.jstor.org/stable/25426915

Gressgård, L. J. (2011). Virtual team collaboration and innovation in organizations. *Team Performance Management*, *17*(1), 102–119. https://doi.org/10.1108/13527591111114738

Hackman, J. R. (2002). *Leading teams: Setting the stage for great performances*. Harvard Business School Press.

Hallgren, E. W. (2009). How to Use an Innovation Audit as a Learning Tool: A Case Study of Enhancing High-Involvement Innovation. *Creativity and Innovation Management*, *18*(1), 45–58.

Hammond, J. M., Harvey, C. M., Koubek, R. J., Gilbreth, L. M., & Darisipudi, A. (2005). Distributed Collaborative Design Teams: Media Effects on Design Processes. *International Journal of Human-Computer Interaction*, *18*(2), 145–165.

Han, S. J., Chae, C., Macko, P., Park, W., & Beyerlein, M. (2017). How virtual team leaders cope with creativity challenges. *European Journal of Training and Development*, *41*(3), 261–276. https://doi.org/10.1108/EJTD-10-2016-0073

Haner, U. E. (2005). Spaces for creativity and innovation in two established organizations. *Creativity and Innovation Management*, *14*(3), 288–298. https://doi.org/10.1111/j.1476-8691.2005.00347.x

Haywood, M. (1998). *Managing virtual teams: Practical Techniques for high-technology project managers*. Artech House.

Henttonen, K., & Blomqvist, K. (2005). Managing distance in a global virtual team- the evolution of trust through technology mediated relational communication. *Strategic Change*, *14*(2), 107–119.

Hertel, G., Geister, S., & Konradt, U. (2005). Managing virtual teams: A review of current empirical research. *Human Resource Management Review*, *15*(1), 69–95. https://doi.org/10.1016/j.hrmr.2005.01.002

Highsmith, J. (2009). *Agile Project Management: Creating Innovative Products*. Addison-Wesley.

Hoegl, M. (2005). Smaller teams-better teamwork: How to keep project teams small. *Business Horizons*, *48*(3), 209–214. https://doi.org/10.1016/j.bushor.2004.10.013

Holton, J. A. (2001). Building trust and collaboration in a virtual team. *Team Performance Management*, *7*(3/4), 36–47.

Hosseini, M. R., Bosch-Sijtsema, P., Arashpour, M., Chileshe, N., & Merschbrock, C. (2017). A qualitative investigation of perceived impacts of virtuality on effectiveness of hybrid construction project teams. *Construction Innovation*, *18*(1), 109–131. https://doi.org/10.1108/CI-10-2016-0052

Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, *15*(9), 1277–1288. https://doi.org/10.1177/1049732305276687

Hueske, A. K., & Guenther, E. (2015). What hampers innovation? External stakeholders, the organization, groups and individuals: a systematic review of empirical barrier research. *Management Review Quarterly*, *65*(2), 113–148. https://doi.org/10.1007/s11301-014-0109-5

Hung, S. W., Cheng, M. J., Hou, C. E., & Chen, N. R. (2021). Inclusion in global virtual teams: Exploring non-spatial proximity and knowledge sharing on innovation. *Journal of Business Research*, *128*, 599–610. https://doi.org/10.1016/j.jbusres.2020.11.022

Jagersma, P. K. (2003). Innovate or die. *Journal of Business Strategy*, *January/February*.

Jasper, S. (2019). *The Effect of Time Zone Disparity on the Performance of Dispersed Innovation Teams in the Australian Biotechnology Industry*.

Johnsson, M. (2017a). Creating High-performing Innovation Teams. *Journal of Innovation Management Johnsson JIM*, *5*(4), 23–47.

Johnsson, M. (2017b). Innovation Enablers for Innovation Teams-A Review. *Journal of Innovation Management*, *5*(3), 75–121. http://www.open-jim.org

Johnsson, M. (2018). The innovation facilitator: characteristics and importance for innovation teams. *Journal of Innovation Management*, *6*(2), 12–44. www.open-jim.org,

Johnsson, M. J. (2021). Factors enabling global innovation teams. In ISPIM Conference Proceedings (pp. 1-12). The International Society for Professional Innovation Management (ISPIM).

Junemann, E. ;, & Lloyd, B. (2003). *Consulting for virtual excellence: virtual teamwork as a task for consultants* (Vol. 9).

Karlsson, L., Löfstrand, M., Larsson, A., Törlind, P., Larsson, T., Elfström, B.-O., & Isaksson, O. (2005). Information Driven Collaborative Engineering: Enabling Functional Product Innovation. *CCE '05 ; the Knowledge Perspective Incollabotative Engineering, Sopron, Hungary, 14t-15th April, 2005*.

Katzenback, J. R., & Smith, D. K. (1993). *The Wisdom of Teams: Creating the High-performance Organization*. Harvard Business School Press.

Kesting, P., & Ulhöj, K. P. (2010). Employee-driven innovation: extending the license to foster innovation. *Management Decision*, *48*(1), 65–84.

Keupp, M. M., Palmié, M., & Gassmann, O. (2012). The Strategic Management of Innovation: A Systematic Review and Paths for Future Research. *International Journal of Management Reviews*, *14*(4), 367–390. https://doi.org/10.1111/j.1468-2370.2011.00321.x

Khosravi, P., Newton, C., & Rezvani, A. (2019). Management innovation: A systematic review and meta-analysis of past decades of research. *European Management Journal*, *37*(6), 694–707. https://doi.org/10.1016/j.emj.2019.03.003

Klitmøller, A., & Lauring, J. (2013). When global virtual teams share knowledge: Media richness, cultural difference and language commonality. *Journal of World Business*, *48*(3), 398–406. https://doi.org/10.1016/j.jwb.2012.07.023

Kristiansen, M., & Bloch-Poulsen, J. (2010). Employee Driven Innovation in Team (EDIT) – Innovative Potential, Dialogue. *International Journal of Action Research*, *6*(2–3), 155–195.

Kuckertz, A., Kohtamäki, M., & Droge gen. Körber, C. (2010). The fast eat the slow – the impact of strategy and innovation timing on the success of technology-oriented ventures. *International Journal of Technology Management*, *52*(172), 175–188.

LaFasto, F., & Larson, C. (2001). *When teams work best: 6000 team members and leaders tell what it takes to succeed*. Sage.

Lahiri, N. (2010). Geographic Distribution of R&D Activity: How Does It Affect Innovation Quality? *The Academy of Management Journal*, *53*(5), 1194–1209. https://about.jstor.org/terms

Laine, T., Korhonen, T., & Martinsuo, M. (2016). Managing program impacts in new product development: An exploratory case study on overcoming uncertainties. *International Journal of Project Management*, *34*(4), 717–733. https://doi.org/10.1016/j.ijproman.2016.02.011

Laitinen, K., & Valo, M. (2018). Meanings of communication technology in virtual team meetings: Framing technology-related interaction. *International Journal of Human Computer Studies*, *111*, 12–22. https://doi.org/10.1016/j.ijhcs.2017.10.012

Larsson, A. (2003). *Making Sense of Collaboration: The Challenge of Thinking Together in Global Design Teams*.

Larsson, A. (2007). Banking on social capital: towards social connectedness in distributed engineering design teams. *Design Studies*, *28*(6), 605–622. https://doi.org/10.1016/j.destud.2007.06.001

Larsson, A., Törlind, P., Karlsson, L., Mabogunje, A., Leifer, L., Larsson, T., & Elfström, B.-O. (2003). Distributed Team Innovation-A Framework for Distributed Product Development. *International Conference on Engineering Design ICED 03 Stockholm, August 19-21, 2003*.

Larsson, A., Törlind, P., Mabogunje, A., & Milne, A. (2002). Distributed design teams: embedded one-on-one conversations in one-to-many. *Common Ground : Design Research Society International Conference 2002 Held 5-7 September 2002, London, UK*, 234.

Lencioni, P. (2002). *The five dysfunctions of a team: A leadership fable*. Jossey-Bass.

Li, V., Mitchell, R., & Boyle, B. (2016). The Divergent Effects of Transformational Leadership on Individual and Team Innovation. *Group and Organization Management*, *41*(1), 66–97. https://doi.org/10.1177/1059601115573792

Lin, C., Standing, C., & Liu, Y. C. (2008). A model to develop effective virtual teams. *Decision Support Systems*, *45*(4), 1031–1045. https://doi.org/10.1016/j.dss.2008.04.002

Liu, X., Magjuka, R. J., & Lee, S. H. (2008). The effects of cognitive thinking styles, trust, conflict management on online students' learning and virtual team performance. *British Journal of Educational Technology*, *39*(5), 829–846. https://doi.org/10.1111/j.1467-8535.2007.00775.x

Lombardo, M. M., & Eichinger, R. W. (1995). *The Team Architect user's manual*. Lominger Limited.

Majchrzak, A., Rice, R. E., Malhotra, A., King, N., & Ba, S. (2000). Technology Adaptation: The Case of a Computer-Supported Inter-Organizational Virtual Team. In *Adaptation*.

Manning, S., Massini, S., & Lewin, A. Y. (2008). A Dynamic Perspective on Next-Generation Offshoring: The Global Sourcing of Science and Engineering Talent. *Academy of Management*, *22*(3).

Manole, I. (2014). Virtual Teams and E-leadership in the Context of Competitive Environment-Literature Review. In *Journal of Economic Development, Environment and People* (Vol. 3).

Martínez-Moreno, E., Díaz, V., da Costa, S., Páez, D., & Mindeguia, R. (2020). What Makes for Successful Innovation Teams in Small and Medium Enterprises? A Multiple Case Study. *International Journal of Innovation and Technology Management*, *17*(08). https://doi.org/10.1142/S0219877021500024

Martin-Martin, A., Orduna-Malea, E., Harzingc, A.-W., & Delgado López-Cózara, E. (2017). Can we use Google Scholar to identify highly-cited documents? *Journal of Informetrics*, *11*, 152–163.

McDonough III, F. E. (2000). Investigation of Factors Contributing to the Success of Cross-Functional Teams. *Journal of Product Innovation Management*, *17*, 221–235.

McGreevy, M. (2006a). Team working: part 1 – an evaluation of current thinking. *Industrial and Commercial Training*, *38*(5), 259–264.

McGreevy, M. (2006b). Team working: part 2 – how are teams chosen and developed. *Industrial and Commercial Training*, *38*(7), 365–370.

Menon, A., Chowdhury, J., & Lukas, B. A. (2002). Antecedents and outcomes of new product development speed An interdisciplinary conceptual framework. *Industrial Marketing Management*, *31*, 317–328.

Meslec, N., & Curşeu, P. L. (2015). Are balanced groups better? Belbin roles in collaborative learning groups. *Learning and Individual Differences*, *39*, 81–88. https://doi.org/10.1016/j.lindif.2015.03.020

Morris, S. (2008). Virtual team working: Making it happen. *Industrial and Commercial Training*, *40*(3), 129–133. https://doi.org/10.1108/00197850810868612

Muethel, M., Siebdrat, F., & Hoegl, M. (2011). *When do we really need interpersonal trust in globally dispersed new product development teams?*

Narasimhalu, A. D. (2005). Innovation Cube: Triggers, Drivers and Enablers for Successful Innovations. *International Society of Professional Innovation Management, 19th-22nd of June*.

Newman, A., Round, H., Wang, S., & Mount, M. (2020). Innovation climate: A systematic review of the literature and agenda for future research. *Journal of Occupational and Organizational Psychology*, *93*(1), 73–109. https://doi.org/10.1111/joop.12283

Niroumand, M., Shahin, A., Naghsh, A., & Peikari, H. R. (2021). Frugal innovation enablers, critical success factors and barriers: A systematic review. *Creativity and Innovation Management*, *30*(2), 348–367. https://doi.org/10.1111/caim.12436

Olaisen, J., & Revang, O. (2017). Working smarter and greener: Collaborative knowledge sharing in virtual global project teams. *International Journal of Information Management*, *37*(1), 1441–1448. https://doi.org/10.1016/j.ijinfomgt.2016.10.002

Olson, J. D., Appunn, F. D., Mc Allister, C. A., Walters, K. K., & Grinnell, L. (2014). Webcams and virtual teams: An impact model. *Team Performance Management*, *20*(3–4), 148–177. https://doi.org/10.1108/TPM-05-2013-0013

Olson, J., & Olson, L. (2012). Virtual team trust: Task, communication and sequence. *Team Performance Management*, *18*(5), 256–276. https://doi.org/10.1108/13527591211251131

Osgood, R. T. J. (2012). Connecting and aligning distributedm global innovation teeams for high performance. *Corate Real Estate Journal*, *2*(4), 324–339.

Oshri, I., Van Fenema, P., & Kotlarsky, J. (2008). Knowledge transfer in globally distributed teams: The role of transactive memory. *Information Systems Journal*, *18*(6), 593–616. https://doi.org/10.1111/j.1365-2575.2007.00243.x

Ottosson, S. (2012). *Dynamisk Produktutveckling*. Tervix förlag.

Painter, G., Posey, P., Austrom, D., Tenkasi, R., Barrett, B., & Merck, B. (2016). Sociotechnical systems design: coordination of virtual teamwork in innovation. *Team Performance Management*, *22*(7–8), 354–369. https://doi.org/10.1108/TPM-12-2015-0060

Pangil, F., & Chan, J. M. (2014). The mediating effect of knowledge sharing on the relationship between trust and virtual team effectiveness. *Journal of Knowledge Management*, *18*(1), 92–106. https://doi.org/10.1108/JKM-09-2013-0341

Parlak, F., Vayvay, Ö., Kunter, F. Ç., & Kalender, Z. T. (2017). Literature Review of the R&D Teams' Leadership to Manage Innovation. *SIBR 2017 Conference on Interdisciplinary Business and Economics Research, 25th-26th May 2017, Bangkok*. https://www.researchgate.net/publication/317358389

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. https://doi.org/10.1016/j.chb.2015.01.034

Peters, L., & Karren, R. J. (2009). An Examination of the roles of trust and functional diversity on virtual team performance ratings. *Group and Organization Management*, *34*(4), 479–504. https://doi.org/10.1177/1059601107312170

Peters, L. M., & Manz, C. C. (2007). Identifying antecedents of virtual team collaboration. In *Team Performance Management* (Vol. 13, Issues 3–4, pp. 117–129). https://doi.org/10.1108/13527590710759865

Pinar, T., Zehir, C., Kitapçi, H., & Tanriverdi, H. (2014). The Relationships between Leadership Behaviors Team Learning and Performance among the Virtual Teams. *International Business Research*, *7*(5). https://doi.org/10.5539/ibr.v7n5p68

Pinjani, P., & Palvia, P. (2013). Trust and knowledge sharing in diverse global virtual teams. *Information and Management*, *50*(4), 144–153. https://doi.org/10.1016/j.im.2012.10.002

Powell, A., Galvin, J., & Piccoli, G. (2006). Antecedents to team member commitment from near and far: A comparison between collocated and virtual teams. *Information Technology & People*, *19*(4), 299–322. https://doi.org/10.1108/09593840610718018

Prasad, K., & Akhilesh, K. B. (2002). Team Performance Management. *Team Performance Management*, *8*, 102–112.

Razinskas, S., Weiss, M., Hoegl, M., & Baer, M. (2022). Illuminating opposing performance effects of stressors in innovation teams. *Journal of Product Innovation Management*, *39*(3), 351–370. https://doi.org/10.1111/jpim.12622

Ries, E. (2011). *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*. Crown.

Ringelmann, M. (1913). Recherches sur les moteurs animes: Travail de rhomme (Research on animate sources of power: The work of man). *Annales de l'Institut National Agronomique*, 1–40.

Robert, L., Denis, A., & Hung, Y. T. (2009). Individual swift trust and knowledge-based trust in face-to-face and virtual team members. *Journal of Management Information Systems*, *26*(2), 241–279. https://doi.org/10.2753/MIS0742-1222260210

Roman, A. V., Van Wart, M., Wang, X. H., Liu, C., Kim, S., & McCarthy, A. (2019). Defining E-leadership as Competence in ICT-Mediated Communications: An Exploratory Assessment. *Public Administration Review*, *79*(6), 853–866. https://doi.org/10.1111/puar.12980

Rousseau, V., Aubé, C., & Tremblay, S. (2013). Team coaching and innovation in work teams: An examination of the motivational and behavioral intervening mechanisms. *Leadership and Organization Development Journal*, *34*(4), 344–364. https://doi.org/10.1108/LODJ-08-2011-0073

Rubin, I. M., Plovnick, M. S., & Fry, R. E. (1977). *Task oriented team development*. McGraw-Hill.

Sack, R. L. (2009). The pathophysiology of jet lag. *Travel Medicine and Infectious Disease*, *7*(2), 102–110. https://doi.org/10.1016/j.tmaid.2009.01.006

Scott, C. P. R., & Wildman, J. L. (2015). Culture, Communication, and Conflict: A Review of the Global Virtual Team Literature. In *Leading Global Teams* (pp. 13–32). Springer New York. https://doi.org/10.1007/978-1-4939-2050-1_2

Seshadri, V., & Elangovan, N. (2019). Innovator Role of Manager in Geographically Distributed Team. *Journal of Management*, *6*(1), 122–129.

Sivakumar, K., & Nakata, C. (2003). Designing global new product teams: Optimizing the effects of national culture on new product development. *International Marketing Review*, *20*(4), 397–445. https://doi.org/10.1108/02651330310485162

Thayer, A. L., Petruzzelli, A., & McClurg, C. E. (2018). Addressing the paradox of the team innovation process: A review and practical considerations. *American Psychologist*, *73*(4), 363–375. https://doi.org/10.1037/amp0000310

Tidd, J., & Bessant, J. (2018). *Managing Innovation: Integrating Technological, Market and Organizational Change* (6th ed.). Wiley.

Törlind, P., & Larsson, A. (2002). Support for Informal Communication in Distributed Engineering Design Teams. *CIRP Design Seminar*, 16–18.

Törlind, P., Larsson, A., Löfstrand, M., & Karlsson, L. (2005). Towards True Collaboration in Global Design Teams? *International Conference on Engineering Design ICED 05 Melbourne, August 15 – 18, 2005*. http://www.diva-portal.orghttp://urn.kb.se/resolve?urn=urn:nbn:se:oru:diva-50852

Tuckman, B. W. (1965). Developmental sequence in small groups. *Psychological Bulletin*, *63*(6), 384–399.

Tuckman, B. W., & Jensen, M. A. (1977). Group & Organization Studies. *Group & Organization Studies*, *2*(4), 419–427.

Tzabbar, D., & Vestal, A. (2015). Bridging the social chasm in geographically distributed R&D teams: The moderating effects of relational strength and status asymmetry on the novelty of team innovation. *Organization Science*, *26*(3), 811–829. https://doi.org/10.1287/orsc.2015.0969

Walthall, C. J., Devanathan, S., Kisselburgh, L. G., Ramani, K., Hirleman, E. D., & Yang, M. C. (2011). Evaluating wikis as a communicative medium for collaboration within colocated and distributed engineering design teams. *Journal of Mechanical Design, Transactions of the ASME*, *133*(7). https://doi.org/10.1115/1.4004115

Weiss, M., & Hoegl, M. (2016). Effects of relative team size on teams with innovative tasks: An understaffing theory perspective. *Organizational Psychology Review*, *6*(4), 324–351. https://doi.org/10.1177/2041386615620837

West, M. A., Hirst, G., Richter, A., & Shipton, H. (2004). Twelve steps to heaven: Successfully managing change through developing innovative teams. *European Journal of Work and Organizational Psychology*, *13*(2), 269–299. https://doi.org/10.1080/13594320444000092

Wheelan, S. A. (2009). Group size, group development, and group productivity. *Small Group Research*, *40*(2), 247–262. https://doi.org/10.1177/1046496408328703

Wheelan, S. A., Akerlund, M., & Jacobsson, C. (2020). *Creating Effective Teams - A Guide for Members and Leaders*. SAGE Publications.

Xu, Q., Chen, J., Xie, Z., Liu, J., Zheng, G., & Wang, Y. (2007). Total innovation management: A novel paradigm of innovation management in the 21st century. *Journal of Technology Transfer*, *32*(1–2), 9–25. https://doi.org/10.1007/s10961-006-9007-x

Yang, Q., Kherbachi, S., Hong, Y. S., & Shan, C. (2015). Identifying and managing coordination complexity in global product development project. *International Journal of Project Management*, *33*(7), 1464–1475. https://doi.org/10.1016/j.ijproman.2015.06.011

Yin, K. R. (2014). *Case Study Research* (5th ed.). SAGE Publications Inc.

Zhang, M. J., Zhang, Y., & Law, K. S. (2021). Paradoxical Leadership and Innovation in Work Teams: The Multilevel Mediating Role of Ambidexterity and Leader Vision as a Boundary Condition. *Academy of Management Journal*.

Zuidema, K. R., & Kleiner, B. H. (1994). Self-directed work groups gain popularity. *Business Credit*, *96*(9), 21–26.

Biographies

Mikael Johnsson. Dr. Mikael Johnsson is Assistant Professor of Process and Product Development at the Division of product development, School of Engineering, Innovation and Design, Mälardalen University, Eskilstuna, Sweden. His research interest is in the field of Innovation Management. A key research area for him is the development and implementation of high-performing innovation teams in organisations. Mikael Johnsson has a multidisciplinary background, including a BSc in Innovation Technology (2006, Mälardalen University, Sweden), Licentiate in Innovation and Design (2014, Mälardalen University, Sweden) and PhD in Mechanical Engineering (2016, Blekinge Institute of Technology, Sweden). Aside from research, Mikael is also an author and innovation management practitioner. His books are used by innovation management consultants and advisors, and innovation leaders in the private and public sectors. As a practitioner, he advises organisations and other innovation management consultants, and supports organisations to improve their innovation management capabilities.
ORCID: https://orcid.org/0000-0001-7546-9469
CRediT Statement: Concepualization, Methodology, Validation, Formal analysis, Investigation, Data curation, Writing - original draft, Writing - Review and Editing, Visualization, Supervision, Project administration, Funding acquisition.