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Designing SMART teamwork: How work design can boost performance in virtual teams

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ABSTRACT

With advancing technological capabilities, as well as a global economy, many organizations increasingly use virtual teamwork to accomplish their goals. Virtual teams are those in which team members use technology to work from different locations. How can managers and organizations leverage knowledge from work design to help virtual teams achieve high performance? In this article, we draw on the extensive work design knowledge, that is, the nature and organization of tasks, activities, and responsibilities, to answer this crucial question. To help organizations manage teamwork in virtual settings, we apply the concept of SMART work design, which involves designing work for teams that is Stimulating, Mastery-oriented, Agentic, Relational, and that has Tolerable demands. Since virtual teamwork has seen unprecedented growth, the practical recommendations from this paper will be relevant to many organizations.

Keywords: virtuality, teamwork, work design, stimulation, mastery, agency, demands

Introduction

"Being able to read faces as a chairperson of a council or meeting ... I have to see who is looking unhappy, who is smiling now? Who is looking to whom? All of this is session choreography that you have to master when chairing. You just can't do it over the phone - you can't." [Jean-Claude Juncker about video-conferencing, 26.03.2020]

The above quote from Jean-Claude Juncker, the former president of the EU-commission, shows that virtual collaboration can be experienced as more demanding, more effortful, and less effective than non-virtual collaboration. The quote was given shortly after March 11, 2020, the date when the World Health Organization (WHO) declared the COVID-19 pandemic and multiple nations went into radical lockdown. As a result, organizations quickly changed their work practices by shifting into telework and working-from-home arrangements. Virtual work arrangements (including telework, virtual teams, and computer-mediated work) have been increasing steadily over the last 20 years. In 2016, 85% of global workers had already engaged in some virtual teamwork (RW3 Culture Wizard, 2016). More fundamentally, virtual work involves crucial changes in the organization of work tasks, in activities, and in managing relationships with others, which essentially requires a work design perspective. This perspective involves managers to think about questions like "Should roles be designed so everyone can do everything or is it preferable for people to specialise?", "Which jobs should be in the virtual team and which jobs should be in collocated team?", "Should the team manage itself or is a team leader needed?", and "What is the role of the team leader?". An extensive scientific literature has shown that work design can make a key contribution in helping teams reaching optimal performance. Based on this literature, we will outline how managers should pay attention to

design work for virtual teams that is stimulating, gives opportunities to master tasks, provides sufficient autonomy in making decisions, gives opportunities to build relationships, and that has manageable workload. Virtual work is now likely to grow even more, with many businesses globally shifting towards virtual and remote work arrangements as a result of the rapid upskilling that has ensued during the pandemic.

Hence, we address the important question "How can managers and organizations leverage what we know about work design to help virtual teams in being more effective?". We define work design as the content and organization of work tasks, activities, relationships, and responsibilities, and we argue that it can make a key contribution to helping virtual teams be more effective. Work design incorporates the idea that managers should modify the composition, content, structure, the environment within which virtual teams are operating and an understanding how this can positively impact collective psychological experiences, including wellbeing, efficacy, and continous team learning. In what follows, to set the scene, we first explain the core concept of team virtuality as well as important performance-related concepts such as team functioning. We then introduce our organising SMART work design model and give specific guidelines that can help managers to make use of the existing work design knowledge.

Theoretical Background

What is team virtuality?

A virtual team is one in which team members work in different locations and, therefore, depend on technology to interact with one another. However, this is not a black and white phenomenon: there is a growing consensus that team virtuality is a continuum — in other words, there is a spectrum from low levels to high levels of virtuality (see Figure 1).

Insert Figure 1 here

In Figure 1, we can see that some teams fall on the lower end of this spectrum. In these teams, members work in proximity and their work interactions happen almost exclusively face-to-face. An example of such a team can be an emergency response team, such as a firefighting crew extinguishing a bushfire or an emergency medical team operating in close proximity on a patient.

When team virtuality is high, this means that team members work in different locations and have to rely predominantly on electronic technology (e.g., email, teleconferencing, working in the 'cloud' etc.) to accomplish their taskwork. Well-known examples of high virtuality are global virtual teams which are separated by significant time zones differences (e.g., think about some members working in New Zealand, others in France, and some in Brazil) and, hence, have strong time-lags in their communication (or who can only use virtual conferencing unless some members work at night or very early mornings). Another example are crowd-workers who obtain their work through online marketplaces (e.g., Innocentive for science and technology-related work, Kaggle for data scientists or TopCoder for software, algorithm-related work to name only a few) which means that individual team members can be located all over the world. The taskwork of the team is entirely accomplished through these online platforms.

Between the extremes of high and low virtuality are teams that are often described as hybrid, rather than medium virtuality, because they rely on both face-to-face and technological means to communicate. Hybrid teams accomplish their task both in face-to-face situations but also while working in different locations.

Altogether, this dimensional perspective illustrates that virtuality is not necessarily a fixed structural work characteristic. Instead, the degree of virtuality can change over time (both slowly but also abruptly). This can happen for several reasons: Temporal changes in the levels of virtuality can be driven by bottom-up processes (e.g., team members who decide to increase individual telework arrangements) as well as by top-down processes (e.g., organizational regulations forcing teams to switch entirely to virtual collaborations) such as radical shifts in technology and digitalization (e.g., tele-medicine where we see an increase in healthcare teams that remotely monitor critically ill patients or virtual teaching in schools and universities). While we recognize the continuum-concept of virtuality, we will — for reasons of simplicity — use the terms "virtual teams" (i.e., teams that have high levels of virtuality) and "non-virtual teams" (i.e., teams have low levels of virtuality) throughout the remainder of the manuscript.

How does team virtuality affect team effectiveness?

Working from different locations may make it harder for teams to reach out towards team members — but it can also mean having less distractions. Working in a different time zone can slow down communication (e.g., when team members are waiting for an urgent response to an email) but — at the same time — increase productivity (e.g., a team working 24/7 because one part of the team works on a task while other team members who are in a different time zone are sleeping). These examples of upsides and downsides show that working with technology changes the way that team members do their work, as well as how they engage on an interpersonal level with each other, with important implications for team effectiveness.

There is a vast body of research investigating the impact of virtuality on team effectiveness (for reviews see selected biography). The main take-away from this research is that there is no pre-determined or automatic effect of virtuality on effectiveness. Rather, *virtual teams*

can perform better or worse depending on many factors. Although factors such as 'who is in the team' can shape performance, our focus here is on some of the wider contextual factors that need to be considered. All of this means that managers need to move away from asking 'Do virtual or non-virtual teams perform best?" to instead ask "How can we design SMART work design for virtual teams to boost their effectiveness?".

In this article, we present a framework for helping managers to design more effective virtual teams in Figure 2. The left side of Figure 2 shows the SMART work design model which draws on as extensive body of research that has shown how features of work impact both team effectiveness but also can have impact on *team functioning*. By team functioning, we mean how effectively the team members interact and communicate with one another to accomplish their work as well as how teams collectively think or feel. The main take-away is that team functioning can be thought of as a broader concept that entails both behavioral and psychological concepts that are relevant for teams to perform effectively. This framework helps us to understand the factors that might need to be in place so that virtual teams can be fully functional and high-performing.

Insert Figure 2 here

In what follows, we now turn our attention to the left side of the framework and describe the SMART work design elements as well as how they influence team functioning and effectiveness.

A SMART work design perspective for enhancing the effectiveness virtual teams

Work design is a multi-dimensional concept that can be used to describe attributes of the task, job, social, and organizational environment. More specifically, work design captures the

tasks and activities that teams (and individuals) carry out (whether the tasks are simple or complex, for example), as well as how these tasks and activities are organised (such as how much control teams have over the tasks, and how interdependent they have to work on common goals).

We recommend designing work so that the individuals and teams experience what we refer to as "SMART work". SMART work design is an acronym that stands for work that is **S**timulating, promotes **M**astery, supports human **A**gency, encourages **R**elational features, and has **T**olerable demands (see Figure 2). While the first four letters (S, M, A, R) are a synthesis of different job resources which can help virtual teams to thrive, the last letter (T) refers to job demands (with "T" indicating that these demands should be tolerable). Overall, the model is located within the extensive body of published research that distinguishes between job demands versus job resources. Hence, the SMART model synthesizes findings from research on more than 25 key individual-level work characteristics as well as team-level design features (e.g., team autonomy and task meaningfulness) identified across multiple work design theories. Considerable evidence across thousands of empirical studies in the work design literature has shown that these work characteristics and team design features promote motivation, better mental health and well-being, as well as better performance and functioning for both individuals and for teams. Furthermore, this scientific research that builds the backbone of the SMART model has been conducted beyond management and applied psychology, but also in fields like Industrial Relations (e.g., showing how self-managing teams promote motivation and welfare), nursing (e.g., showing how badly design work threatens to provision of care), or operations management (e.g., how work design improves lean systems). The SMART model has been derived both from research on work desing focusing on individuals and work teams. In our

research with more than 1,800 working participants, we supported and replicated the proposed structure of the five super-ordinate concepts (S,M, A, R, and T) which means that more specific work characteristics (e.g., task variety) are indicators of these five dimensions. Thus, industries can determine which indicators are most relevant to their work context. Our research has also shown that these dimensions show specific predictions wih job satisfaction, experienced meaningfulness, fulfilment of relatedness and safety needs. The SMART model applies to virtual teams in two ways. First individual team members benefit from having SMART work, and we consider how well-designed team work helps to achieve better quality individual-level work design. Second, we consider how team-level aspects can be designed to be SMART, such as how agency can be applied to the team-level (e.g., by designing self-managing teams).

In the next section, we lay out that with an increasing extent to which these five components are present in the team's work environment (left side of Figure 2), team functioning will be improved, that is, virtual teams can better share information with each other, have better quality communication processes and develop psychological states that are conducive to team functioning (such as trust and team empowerment; see central part of Figure 2). With SMART work design, members are also expected to have motivational gains, have higher satisfaction, achieve personal growth, and have reduced levels of stress. Overall, a better team functioning helps virtual teams to reach better performance and have high levels of wellbeing (see right part of Figure 2). To achieve this, we have summarized our managerial recommendations from the SMART framework in Table 1. Over the last years, we have also collated a number of resources from our own work (www.futureofworkinstitute.com.au) and the SMART model that managers and organizations can use (www.smartworkdesign.com.au).

Insert Table 1 here

Stimulation

The first letter of the model stands for Stimulation (or stimulating work). Stimulating work can arise from varied, interesting, meaningful, and challenging tasks in which team members use and develop their skills.

Stimulating work can often be created when team tasks are complex which require collective problem-solving. Qualitative research has shown that complex work in virtual teams stimulates better communication and team reflection – both processes that are conducive for team performance. Furthermore, virtual teams may particularly benefit from complexity because difficult tasks (in contrast to simple tasks) stimulate thorough debates among team members which ultimately promotes better team solutions.

Complex problems that require unique ideas and solutions are well suited for teamwork as they can often not be solved by a single individual alone. A simple example for working collectively on generating unique and creative ideas are brainstorming activities. In fact, virtual teamwork is particularly well suited for these type of problem-solving tasks. When non-virtual teams work on a brainstorming task, they usually perform worse because team members experience a phenomenon which is called “production blocking”, that is, team members either do not voice ideas (or forget them) because they are waiting for other team members to finish with their verbal contributions. In contrast, virtual teams often use communication technology that allows all team members to concurrently add their ideas into a chat without having to wait for others.

We also know that virtual teams tend to share more unique knowledge in comparison to non-virtual teams. Unique knowledge refers to pieces of information that is held by a single team

member. For example, a software expert who works in a marketing project team can share unique domain knowledge about algorithmic procedures that are relevant for placing product ads in an online search system. The reason why virtual teams tend to share more unique knowledge is that many virtual tools (such as emailing, virtual chats) involve time lags in the communication process (we refer to this as asynchronicity). With respect to unique information sharing, virtual forms of communication can thus be advantageous. Time lags in communication can give team members more time to elaborate what type of information is still missing. Time lags also allow more time for deeper processing of what has been said and team members have less chances to inhibit contributions from other team members. To illustrate this: When working via email, two members can share unique information at the same time, whereas, in a face-to-face context, the team members that speak first will inhibit other ones to voice out their ideas. As a result, virtuality facilitates deeper elaboration and reduces pressure to think "on the fly". Due to these reasons, the use of "asynchronous" virtual communication tools (e.g., email or chat) can help to increase unique information sharing in teams. However, managers should also keep in mind that many virtual tools restrict the volume of communication and make it harder to engage in relationship building activities — for example, it is easier to chat and exchange redundant information in a face to face context than doing this using emails.

Focusing on high levels of problem-solving requirements also aligns with the idea that some tasks are better suited for virtual settings. To identify task-fit, managers can classify team tasks into four categories: "generate tasks" (e.g., brainstorming ideas, planning an event) , "choose tasks" (e.g., finding a correct answer, reaching consensus on a topic), "negotiate tasks" (e.g., conflict management), and "execute tasks" (e.g., tasks requiring physical movement, psychomotor tasks, sports, battles, or production tasks). As a first rule of thumb, those tasks that

have more cognitive requirements (i.e., generate, choose and negotiate tasks) as opposed to tasks that require more direct behavioral performance (i.e., execute tasks) are better suited for virtual teams. In other words, those teams that predominantly engage in *execute tasks* (e.g., surgical teams operating a patient, rescue crews, or firefighters) are expected to perform poorly if they had to work virtually together – simply because the technology is not there yet to fully support these teams.

However, managers and organizations should keep in mind that with evolving speed in which virtual technology is developing, *execute tasks* could also be feasable under high levels of virtualty: Example for these developments with respect to "physical remote teamwork" are robot-assisted surgeries during which team members can execute operations from different locations, "psychomotor activities" in virtual team sports, or "physical combats" in virtual online battles (e.g., military teams).

Stimulation can also be increased when teams are working on non-routine tasks, that is, when teams are faced with situations in which team members cannot accomplish work in a consistent fashion or by using a standardized procedure. To illustrate a routine task, think about a costumer service team that has to deal with a predictable set of costumer requests that can be answered in a consistent way. In contrast, we may find more non-routine work in science teams that have to come up with a very unique set of responses with no pre-existing standard response templates. Non-routine tasks mean that the team has to deal with an unprecedent and ambigous situations, so that regular team coordination is challenged. The team has to invest time to establish a way that the task can addressed by the team members, which is often time-costly and requires additional efforts. Stimulating work should ideally be paired with giving teams sufficient autonomy (i.e., Agency). Teams that can rely on self-managing behaviors and which

take control over operational responsabilities often perform better in non-routine tasks because they have enough freedom to adapt effectively to novel situations. When working with virtual teams, managers should be aware that non-routine tasks (in contrast to routine tasks) can lower levels of trust in virtual teams because non-routine tasks reduce familarity with the task environment and team members scrutinize each other more closely. In this respect, managers should consider additional interventions that elevate team trust within virtual teams.

What managers can do to make work more stimulating for virtual teams: In order to help virtual teams, managers should review what type of tasks their teams are predominantly working on. Within knowledge industries, managers should have little concern as most tasks require high levels of problem-solving and hence are likely to be stimulating. Virtual teams may be particularly successful in solving problems that require high levels of sharing unique information. However, if team tasks require physically execution and manual labour, teams may encounter challenges within a virtual setting. Organizations should either try to avoid virtual teamwork in these situations or ensure that the virtual technology allows the team to manually execute interdependent tasks.

Managers and organizations should also let their virtual teams work on complex problems instead of simple piecemeal tasks. This is an important note for organizations who are heavily relying on digital crowdworking marketplaces (e.g., crowdflower, upwork, Mturk) that essentially decompose complex jobs into smaller fractions — often called micro-tasks. Microtasks are small and very simple digital tasks that are carried out remotely (e.g., transcriping text snippets, rating pictures, or categorizing objects). This type of work often lacks the complexity which is required to make work stimulating. Yet, it is possible to create stimulating work for virtual teams of crowd-workers. Crowd-working teams can collaborate effectively on

complex work assignments (examples are developing software solutions for the aeronautics agency). However, organizations should allow virtual teams sufficient time for coordination and communication so that teams can deal with non-routine complex work. When non-routine situations occur, managers should also consider to balance team members capabilities and capacities so that they are challenged to work and learn through complexity.

When managers give virtual teams complex work, they should encourage them to engage more in open information sharing as complex work requires teams to keep everyone 'in the loop' about key issues that affect the business. Managers need to keep in mind that that some virtual tools are worse (e.g., e-mail) and other tools (e.g., videoconferencing) are better suited to stimulate open information sharing.

Mastery

The second letter of the model stands for Mastery which refers to the degree to which work in teams provides feedback and role clarity. Mastery means that teams have gained comprehensive skills and knowledge about their jobs and are able to navigate through complex environments. Both task feedback and role clarity are important for virtual teams to master their environment because without feedback about appropriate performance, virtual teams cannot know what strategies are effective and fail to gain comprehensive knowledge and skills. Furthermore, clarity about roles is equally important for virtual teams to master their work as it helps them to smoothly coordinate their activities and prevent communication problems.

Feedback (from others) refers to the degree to which members of the organization (co-workers, supervisor, or clients) provide clear information about performance. It is noteworthy that *feedback from others* is distinct to *job feedback* as the source of the feedback has a social origin and therefore incorporates an interpersonal quality. In contrast, the source of job feedback

originates from the job and work activities itself. To illustrate this conceptual difference, programers would receive job feedback when they start to run their code on their computer and obtain an error message (e.g., “Error: Variable X is not defined!”). However, the same programmers would receive *feedback from others* if coworkers told them that they cannot understand their coding and that it needed more annotated explanations.

Overall, when there are high levels of feedback from others in a virtual team, it means that all team members have sufficient opportunities to receive feedback from their team members (and manager) about their performance. In contrast, when feedback from others is low, team members rarely — if ever — check in with their co-workers about the results that they are delivering.

Both in virtual and non-virtual teams, feedback has shown positive effects on team functioning. For example, research has shown that giving virtual team members peer feedback about how they plan, set goals, and communicate is associated with better performance and better conflict management strategies. Since virtual teams work with technology to communicate and plan their activities, these digital traces constitute “big data” which can be processed and provide feedback about participation patterns. In this respect, virtual technology has the potential to improve team learning. Teams that receive a combination of individual and team-level task performance seem to benefit most in terms of team performance, as this allows individuals to associate their individual efforts to team performance which reduces free-rider effects (i.e., the tendency to let others do the work in groups).

Moreover, it can be helpful to think about how the feedback is provided. For example, when the feedback giver can describe the exact sources for errors (rather than just giving overall performance scores) to the team, the team can learn more specifically how to improve which will

ultimately affect their performance. Qualitative research has revealed different mechanisms that explain why frequent performance feedback (either using visual management tools or positive outcome feedback from the team leader) can help to increase virtual team functioning: Performance feedback allows teams to better plan their performance, enhances the transparency of operations and structures, and it likely also strengthens team identification.

Mastery also involves giving team members sufficient role clarity. Role clarity in teams occurs when all members collectively have access to sufficient information to perform their roles adequately. When roles are clear for all team members, people understand what has to be done by whom and what is expected from each team member. In essence, high team role clarity means that there is no confusion about how the work needs to be accomplished. High team role clarity can be achieved by providing guidelines that help team members to understand what is expected from them. In contrast, when role clarity in teams is low, team roles are rather ambigous. Team members may ask themselves constantly "who is responsible for this task?" because they have very vague directions with respect on what needs to be done or they rarely know if work outcomes are considered acceptable. One reason for low levels of team role clarity is when teams are understaffed, that is, when there is just not enough workforce to complete the expected work. When teams are understaffed, team members have to take on tasks (from missing co-workers) which typically results in additional responsibilities. In these situation, if there is not a formal role restructuring introduced by the team leader (or the team itself), there can be lots of ambiguity to individual team members about which tasks they will now personally responsible for and which tasks should be completed by other team members.

Research from (non-virtual) teams has shown multiple benefits for having high levels of role clarity. Higher levels of team role clarity have motivational benefits, that is, teams are more

satisfied with their work and the chances for team members leaving the team (or the organization) are reduced. Role clarity in teams is also associated with higher collective wellbeing of team members, extra-role performance, affective team engagement.

Both in virtual and non-virtual teams, role clarity is also an important factor to enhance team trust. Trust between team members is important as it shows that everyone has faith that their coworkers are working towards goal accomplishment. When trust is low, team members may be concerned that not everyone is working (as they should) on assigned tasks. As a result of low trust, team members can start to monitor what everyone else is doing. In virtual contexts, when team members are working in different locations and there is no possibility to see co-workers, trust is an important indicator of team functioning. Managers of virtual teams might start thinking that working remotely requires them to stronger monitor what team members are currently doing. Hence, managers may risk to micro-manage their teams. However, when managers do this, they may inadvertently harm team trust. In fact, virtual teams perform better under high levels of team trust. In other words, performance can be boosted by stimulating a psychological climate of trust within a virtual team. To do this, managers should rather ensure that teams have high levels of role clarity as this conducive to both team trust and team coordination.

What managers and organizations can do to improve mastery: There are multiple ways in which managers can improve mastery. One way is to encourage feedback giving behaviors within teams. Managers should keep in mind that virtual team members have less opportunities to personally address each other. Hence, they need to more systematically plan how they can increase opportunities for team members to receive feedback from their team members. One option is to provide virtual teams with Online-Feedback-Systems which are

online tools that regularly prompt team members to indicate how satisfied there are with the performance of their team members. The peer-collected data is used and aggregated to the team-level. Data can be displayed on a dashboard so that the team (and its members) can monitor if they are "on track". In this respect, virtual teamwork constitutes a real opportunity as it allows to collect and directly process information from co-workers and present it in an anonymized way. Collecting and presenting feedback from others in an anonymized fashion has the added value that peers are not socially inhibited to point out severe performance issues that arise from other team members (i.e., excessive "sugar coating"), that is, online feedback might be more objective than providing feedback face-to-face. Managers should consider giving feedback on different levels (such as providing feedback to the entire team but also giving feedback to individuals), varying feedback sources (e.g., encourage co-worker feedback but also incorporate external client feedback to identify blind spots), and think about good timing for feedback (e.g., give feedback at midpoint of a project so that virtual teams can make adjustments).

Furthermore, managers need to be aware that team member can benefit from clearly defined roles and that they should clearly articulate what they expect from their teams. Thus, it can help to assign specific roles with outlined responsibilities. If in doubt, managers can work out guidelines and policies that help team members to know how they can divide their time properly. Allow time to explain the team what needs to be done, what the objectives are, and help them to plan their goals. Finally, managers should keep in mind that teams can also define different roles for themselves and team leaders should encourage their teams to do so. This advice aligns with the idea of giving teams sufficient agency in making decisions. That is, role clarity is helpful, but managers need to be aware that if they prescribe roles too tightly, they may risk reducing the level of self-management for their virtual team. A good solution is to let the

team as a whole know what is expected of them and then letting them clarify their individual roles in a self-determined way. We will expand on this issue in the next section in which we explain the letter A (i.e., Agency).

Agency

The third letter of the model stands for Agency which refers to the level of control that teams have to determine their tasks and decide on a course of action (we will use the terms agency and autonomy interchangeably). With high levels of team autonomy, teams can make decisions and plan work activities at their own discretion. Furthermore, team members are capable to more easily adapt to changing work conditions. In virtual (and non-virtual) teams, autonomy has shown consistently positive associations with team performance. Highly autonomous teams are sometimes referred to as 'self-managing teams' (or autonomous/ empowered teams). Self-managing teams can coordinate their responsibilities, which include, among others, prioritizing tasks, allocating tasks among team members, and assessing the team's progress and performance. Self-management is particularly suitable for virtual teams because due to working in different locations, the team may not receive frequent feedback from organizational stakeholders, recognition from a team leader, or experience peer pressure — all extrinsically motivating factors that can drive team effectiveness. However, if the team feels highly empowered, these functions will be assumed by virtual team members. In other words, empowerment within self-managing virtual teams may substitute the role of a formal team leader. Research on team autonomy has shown positive effects on team members' perceptions of procedural justice, quality of team decisions, members' satisfaction, the effectiveness of team communication, as well as the levels of costumer satisfaction. Effective communication is particularly important in virtual teams which often suffer from communication breakdowns –

prominent examples are that team members have a bad internet connection or issues with bandwidth restriction during a virtual meeting. These technology aspects of virtual work can cause significant delays and impair the quantity (and quality) of team communication. With sufficient autonomy, teams are more flexible in selecting virtual technology which serves best to their communication purposes.

It is also important to highlight that in self-managing teams there can be a critical tension between the level of team autonomy and the individual level of autonomy. In contrast to teams that have low levels of autonomy, self-managing teams have substantial latitude in deciding what tasks to perform and how to execute them. Such freedom to take responsibility for their team's performance requires coordination, ranging from setting team goals, monitoring work progress, and initiating improvements to the team's functioning. When all decision-making autonomy is vested within a team, it means that team members control each other's behaviors, and this can go beyond the control that a team manager may exercise. As a result, giving teams high level of control may be at the expense of the individuals experiencing high job autonomy. In sum, providing, granting teams high levels of autonomy does not necessarily mean that all team members will experience this in a similar way.

What managers can do to increase team autonomy: Managers should avoid micro-managing their virtual teams. Instead, when mangers give the team enough decision-making discretion, this will drive autonomous and self-managing teamwork. To help their teams, managers need to give the team access to necessary tools and rights/permission so that they can complete tasks in a self-managed way. Most importantly though, let your team decide how they want to go about getting their work done or what the best methods for them to use in carrying out their work. For example, let your team members decide what the best platform is to have virtual

meetings (instead of prescribing to use organization-specific platforms or virtual tools that do not meet the specific needs to get a job done). That is, help your virtual team as much as possible in removing unnecessary organizational or technology boundaries (e.g., grant them access rights and permissions to read and edit virtual folders) that hinder them from being effective.

It is also important to let your virtual team decide when they want to carry out particular activities; because those team members who are working remotely (in different time zones) may not be able to work during specific times. Give your virtual team latitude in articulating own team objectives and listen to your team when you see that they have found better ways of organising their work; the more your team will take control of the situation in terms of planning, scheduling and sequencing their work, the more motivated your virtual team members will be in accomplishing their work.

Relational

The fourth letter of the model stands for Relational which captures the extent to which teams collectively experience a sense of support, purpose, and social contact. In other words, relational teamwork reflects features of the social work environment, which includes high levels *interdependence* and *relationship building*.

Interdependence is defined as the extent to which taskwork is designed so that members depend upon one another for access to critical resources and create workflows that require coordinated actions. An illustration of low interdependence occurs when team members can work separately on their tasks with little workflow between each other: for example, a group of six data specialists who each clean 10 files from a project with 60 datasets. Essentially, low interdependence means that that the team output is equal to the sum of individual contributions and team performance could be captured by the summed time that each individual needs to clean

all datasets. In contrast, high interdependence means strong interconnections and collaboration on collective tasks. If interdependence is lacking, expecting workers to operate as a team can backfire. Thus, managers should try to increase interdependence by re-designing workflows. In the data scientist example, this could be assigning collective responsibility for all datasets and giving the team access to specific resources, such as software, various virtual folders and ensuring that the team works on one cohesive file of programming code. Compensation and reward system can also help to increase interdependence: Instead of rewarding the data scientists based on the number datasets they cleaned indidvidually, the team could be compensated as a collective.

In virtual teams, task interdependence has shown to positively influence team functioning (e.g., team learning, planning behaviors, negotiation processes, and trust) as well as team performance. The reason for this effect is that interdependent work encourages team members to communicate, support each other and cooperate; all team processes that elevates collective perceptions of team identity and efficacy.

On a cautionary note, managers who work with virtual teams that are *also* short-lived (e.g., temporary teams) should be aware that interdependence will most likely harm team functioning and performance. This is not surprising: Imagine working within a team in which team members hardly know each other; everyone is working from different locations and restricted to use a specific and very constrained communication technology; yet, you require access to critical resources to coordinate interdependent efforts. In those cases, the teams may not be able to reach their full performance potentials.

Relationship building constitutes the extent to which work provides opportunities for advice and assistance from others. Relationship building in teams means that team members

encourage individual contributions, recognize team accomplishments, and frequently help each other. Relationship building at work helps to improve the quality of relations that team members have with each other. When relationship building is high, team members feel that they can develop friendships with other team members and that their team members are taking a personal interest in each other's welfare. High levels of relationship building also means that there are opportunities to meet others at work (which is harder when working from different locations). In contrast, when relationship building is low, team members have very little opportunities get to know their team members better. On an individual level, receiving social support at work has shown to improve personal wellbeing, commitment to the organization, and job satisfaction. Research has also shown that relational strength in virtual teams also helps to improve innovation. That is, when virtual teams benefit from socially supportive structures, they can even outperform non-virtual teams with respect to producing innovative outcomes. Thus, organizations need to proactively think how they can provide ways that faciliate a collective perception of social support and relationship building for virtual teams who often are actually "physically" there to support one another.

What managers can do to improve relational work: In order to improve relational work characteristics, managers should, in a first step, assess levels of interdependence and then consider re-designing the work in a way that enhances interdependent teamwork. For example, creating workflows that enable team members to exchange ideas, communicate more frequently, and that highlight rewards at the team-level. If assessments reveal that teams are working quite interdependently and are well connected, managers may already have created workflows that foster high levels of interdependence between team members. Managers should also keep in mind that interdependence can vary over the lifecycle of a project and that there are times when

it will simply be more efficient to break up tasks logically and have members contribute their own work individually, maybe comment on others' work, and integrate the work maybe at various stages. Thus, it is not necessary to always have high levels of task interdependence, that is, it is okay to give team members periods in which they work independently on various tasks of a project.

Second, there are a variety of creative ways that managers and team leaders can use to increase relationship building in virtual teams. Some organizations create specific non-task related channels on virtual communication platforms which can be used to post questions or anounce social events. There are even examples of having regular virtual "morning teas" which allow team members to meet virtually even though they are in different locations. Furthermore, managers can be a role model by initiating support towards their team members as well encouraging their team members to support those members who are isolated from the core team.

Organizations that work with a group of outsorced workers in one location (e.g., software developers in Spain) and another group of the team in another location (e.g., software content providers in Germany), can install cameras (and screens) in the kitchen space of both offices so that team members from both locations can meet informally during coffee breaks.

Tolerable demands

Fifth, team work design should have tolerable demands. Team demands include all aspects of work that require sustained physical or psychological efforts, such as heightened levels time pressure, physical efforts, emotional demands, and/or role conflict. To illustrate a team with increased physical efforts, think about teams who are working in car manurfacutring plants where it is required to lift heavy objects, so that team members collectively need to use a lot of strength over an extended period of time. High level of psychological demands can be

found in costumer service teams that often have to deal with frequent costumers complaints or in emergency response teams that have to deal with catastropic desasters (including traumatized and very distressed patients). As a result, demands have both physiological costs (i.e., being physically tired) as well as psychological costs (i.e., regulating emotional distress). We included this category in the overall framework because job demands are consequential for employee health and the team's wellbeing. If demands are too high, individual and teams start to experience symptoms of strain, they can become exhausted, or even get sick. Therefore, we argue that demands for virtual teams should be kept tolerable and managers should take care that they are not excessively present in the team's work environment.

With respect to demands in virtual teams, we now focus specifically on time pressure. Time pressure results from a lack of time to accomplish work-related tasks and projects. More importantly, beyond individual perceptions of time pressure, an entire team (and even an organization) can collectively perceive to be time-pressured. When teams experience high levels of time pressure, the quanity of work that has to be accomplished does not match a realistic time frame to be properly processed by all team members – a scenario which may be likely driven by "just in time" lean management approaches that focus heavily on efficieny. As a result of this, team members are getting rushed and, hence, become unhappy and drained.

With respect to the effect of time pressure in teams, there are two arguments in the literature. The first argument is that time pressure can be perceived as stimulating for team members, that is, team members are pressured to focus on the task and work more efficiently. The opposite argument is that too much time pressure is typically associated with negative mood, stress and exhaustion. In line of the "time pressure is stimulating" argument, research (both in virtual and non-virtual teams) has indeed shown that time pressure increases the pace and task

completion rate of team members, improves both the extent and efficiency of team communication, and enhances work engagement.

However, in line with the argument that time pressure in teams is detrimental for team functioning, there is evidence which has shown that time constraints are detrimental for both decision-making processes and outcomes in virtual teams. Furthermore, in non-virtual teams, time pressure has shown to reduce efficacy, accuracy of team mental models, and team performance. To reconcile these arguments, time pressure should be kept at moderate levels both in virtual and non-virtual teams: Whereas too much time pressure induces likely stress in teams, it is very likely that very low levels of time presure lead to underperformance.

What managers and organizations can do help virtual teams deal with demands and time pressure: Managers who work with virtual teams should consider how they can assess realistic demands (time pressure and workload) that they assign to their virtual teams. Most importantly, this means that they have clarity how much time is required for certain tasks to be completed and how this fits with a larger team project outline. If team tasks cannot be completed within a predefined time frame, this needs to be addressed as soon as possible by one of the team members early on, so that the managers and organizations can make necessary adjustments. In other words, managers should not promise a client that the outcomes for a project can be delivered in 2 weeks, whereas – in reality - the project would actually require 3 months. As a rule of thumb, managers should use rather conservative estimates (i.e., worst case and not best-case scenarios) to time-budget projects. This can be achieved by reviewing time budget for previous projects of similar scope and then adding a time buffer (e.g., by multiplying these previous time budgets with a factor of 1.25 to allow for a 25% buffer). Other organizational top-down strategies that companies like Volkswagen have used to deal with workload and prevent

blurring between work and home life are company-wide agreements that stop servers in routing emails after shifts (i.e., messages can only be received between 07.00 to 18.15 of the local time zone). Besides these preventive approaches, managers can also consider to hire additional support staff that can help their virtual teams in better distributing workloads and free up time for the team to work on key tasks. Overall, managers should regularly monitor, that is, trying to measure,the level of demands (e.g., time pressure and workload) to better understand what situations may cause flucations in demands. Besides time pressure, managers should recognize that other demands (e.g., role conflict) could contribute to the team's experience of intolerable demands.

There may be instances when it is hard to reduce the level of time pressure within a team. For example, in our own research in tele-healthcare, we have observed how virtuality impacts teams which have increasingly decentralized and dispersed team members: On the one hand, ward nurses are working with critically ill patients on a remotely located ward, and on the other hand, doctors are sitting in a centralized control room and coordinate actions using virtual technology to communicate with those remote team members. For these tele-healthcare teams, time pressure cannot necessarily be reduced when patients' lives are at risk and the team needs to act very fast. In these cases, organizations should consider increasing other features of the SMART framework (e.g., giving teams more autonomy or allowing more opportunities for relationship building) as this could help to offset the negative effects of high demands.

With virtual teams, managers should watch out for additional demands, such as non-work related interruptions, home-to-work interferences or techno-stress (demands created by technology use). Managers should also be aware that in virtual teams, members often work in *multiple teams* which can result in intensive workloads as deadlines from different projects may

overlap. Thus, ensure that your team members do not have overlapping intensive work periods from multiple teams. One strategy is to encourage your team members to communicate these issues to your team and then finding ways that this person receives some back up.

Use of the SMART model in Industry and common pitfalls for its implementation

So far, the SMART model has been used with various industry partners across Australia. For example:

- The SMART model has been used with a large Federal Government organization (20,000 employees) to embed better work design practices across the organization and using the model to redesign the work within specific departments.
- Multiple state government organizations have used the SMART model to understand the challenges and opportunities in relation to their work design and used this process to redesign work for better motivation, wellbeing, performance, and to reduce psychosocial risks.
- Two large state government bodies (one agency with more than 8,900 employees and one government department with about 1,500 employees) have so far measured SMART work design to better understand the experiences of those working from home during COVID. They used the results to improve flexible working practices in the future to drive positive wellbeing, performance outcomes, and to develop a mental health and wellbeing strategy.
- We have also used the SMART model working with teams from public healthcare which involved re-design of roles and decision-making for diagnosing patients with rare diseases. Our qualitative analyses showed that work redesign positively affected SMART work design and improved team functioning.

- The SMART model has also been used in Executive Education where it generated great interest (e.g., many of the executives were very keen to implement smarter work strategies for their teams following the challenges of COVID-19 and mentioned that SMART work design covers both the functional part of job roles, but also the issue around tolerance and workload which was foundational to their work).

Overall, the SMART work design framework resonates well with many practitioners who benefited from going through what each of the elements of SMART are and using this to reflect on their own workplace.

When using the SMART model, a common pitfall is that many organizations often do not measure the extent of SMART work design before they start implementing formal work redesign. However, this step is key to better understand how these formal changes in work design that often impact multiple features of SMART work are perceived by teams working in different departments and the respective team members.

Summary and Concluding Comments

As the extent of virtual work is increasingly rapidly, organizations must understand how they can best assist virtual teams to function effectively. We have clarified how managers can leverage knowledge around work design to help virtual teams reach optimal performance. The SMART framework can be used by organizations and managers to measure, monitor, and re-design features of the virtual teams' working environment. In applying this framework, managers should consider all five letters (SMART). That is, paying attention to only a single dimension (e.g., designing stimulating work that lacks agency), may not necessarily create the right conditions for teams to be motivated and to be fully functional. Finally, we recommend that

organizations should regularly assess the extent of SMART work in their teams (see resources in Table 1) so that they can better intervene and re-design work when this becomes necessary.

Figure 1. Understanding the dimensional concept of team virtuality: key criteria and examples for low, medium, and high levels of virtuality

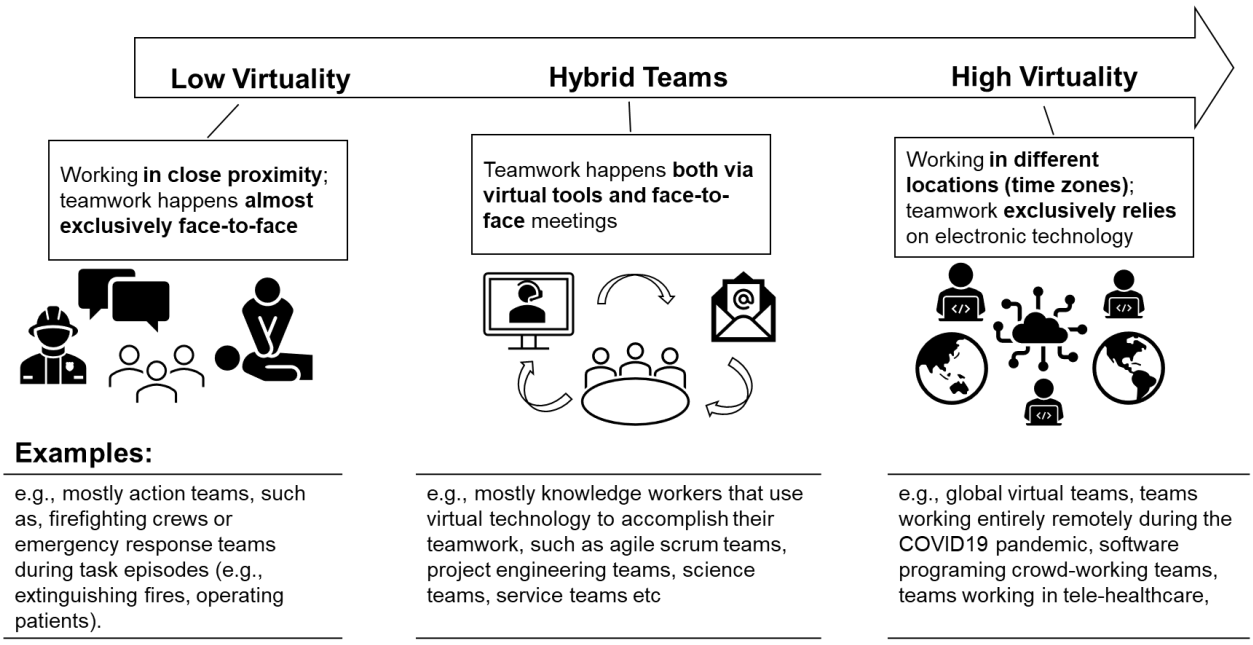

Figure 2. SMART Work design conceptual framework for supporting virtual teams

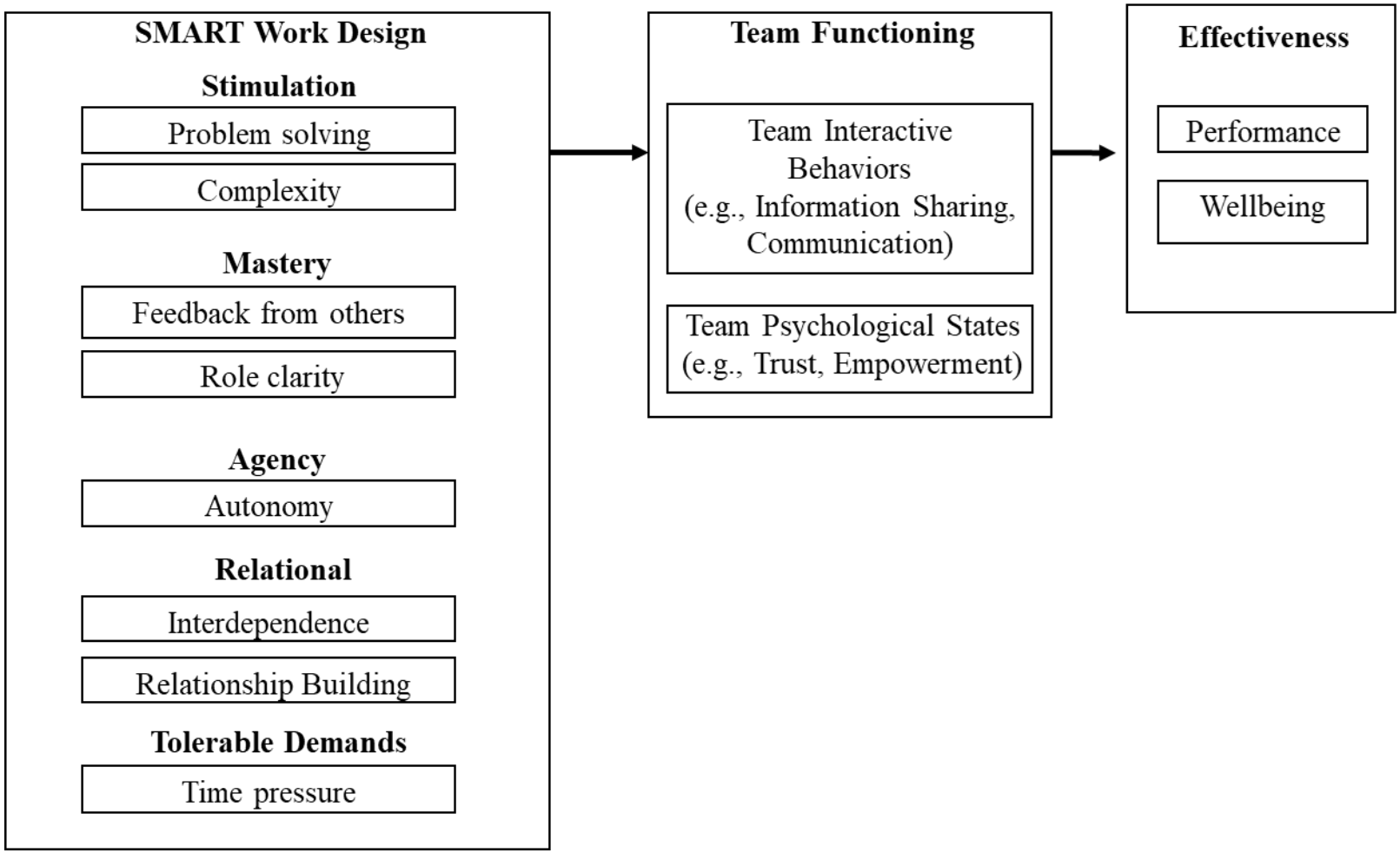

Table 1. How can managers design SMART work for virtual (and non-virtual) teams?

SMART Work Design Framework	**Core Dimensions** **Examined in the Virtual Team Literature**	**Managerial advice**
Stimulation	Problem-Solving	• Allow teams to work on complex problems, in particular, if these problems cannot be solved by a single individual alone
	Complexity	• Embrace complexity of a project: Give your virtual team time to master the complexity of a project that is stimulating and that encourages team members to frequently exchange and communicate. • Avoid decomposing of complex projects into simplistic micro-tasks. • When non-routine situations occur, balance team members capabilities and capacities so that they are challenged to work and learn through complexity Further suggestions and strategies: smartworkdesign.com.au/stimulating
Mastery	Feedback	• Take advantage of Online-Feedback-System which encourage team member feedback. • Make use of different *levels for feedback*, such as providing feedback to the entire team, giving feedback to individual team members, and giving feedback to subgroups of the team (e.g., two members who have been working intensely on a specific element of a project). • Take advantage of varying *feedback sources*: You are not the only one who should give feedback. Encourage peer-to-peer feedback or incorporate ways of client feedback. This is also a good way to identify *blind spots*, for example, by contrasting self-rated performance with other sources of performance evaluations.

		• With respect to *timing of feedback*, ensure that your team receives feedback regularly but also not too frequently. A healthy middle ground is to select the midpoint of a project life cycle (so that teams can make adjustments) and the end of a project (e.g., after teams have submitted a report or presentation for a client, use this time for reflection). • Regarding the *how-to-give* feedback, remind yourself and the team that feedback should be *specific* (e.g., rather than stating "you did a fantastic job", focus on specific behaviors and context, e.g., "You supported John and Mary in dealing with client complaints, and this was critical during the early phase of this project", *constructive* (that is, even when giving negative feedback, always look for positive aspects), and *respectful.*
	Role Clarity	• Be clear with what you expect from the team as a whole (that is, what are the performance requirements for the team?). When in doubt, work out guidelines and policies that help team members to know how to divide their time properly. Allow time to explain the team what needs to be done, what the objectives and the planned goals are. Further suggestions and strategies: smartworkdesign.com.au/mastery
Agency	Autonomy	• Do not micro-manage your virtual team. Instead, give the team enough decision-making discretion which will ultimately drive autonomous teams and facilitate self-management (e.g., set clear goals and give the team access to necessary tools and rights/permission so that they can complete tasks in a self-managed way). • Removing unnecessary organizational or technology boundaries (e.g., grant teams access rights and permissions to read and edit virtual folders) that exert tight control and hinder the team from being effective. • Let your virtual team decide when they want to carry out particular activities; because those team members who are working remotely (in different time zones) may not be able to work during specific times

		Further suggestions and strategies: smartworkdesign.com.au/agency
Relational	Interdependence	• Design the work in a way that enhances interdependence and exchange between your team members.
	Relationship building	• Increase chances for team members to 'virtually meet'. Create shared 'virtual morning teas' or enhance visibility of coffee kitchens that are installed in different location (use two-way cameras to allow members from different locations to informally meet in virtual places). • Install and support social support channels on virtual platforms that allow team members to ask for advice. Praise team members when they help other team members on these virtual channels.
		Further suggestions and strategies: smartworkdesign.com.au/relational
Tolerable Demands	Moderate Time Pressure	• Keep time pressure manageable (i.e., stimulating but not exhausting). For example, always include a worst-case scenario for project time-budgeting.
	Additional Demands	• Consider a company-wide agreement that stop servers in routing emails after shifts to reduce blurring of home and work life • Watch out for additional demands, such as non-work related interruptions, home-to-work interferences when working from home or techno-stress (demands created by technology use) • Be aware that in virtual teams, members often work in *multiple teams* which can result in intensive workloads as deadlines from different projects may overlap. Thus, ensure that your team members do not have overlapping intensive work periods from multiple teams. One strategy is to encourage your team members to communicate these issues to your team and then finding ways that this person receives some back up.
		Further suggestions and strategies: www.smartworkdesign.com.au/tolerable

Selected Biography

An excellent overview about the different research streams that have studied virtual work is given in:

Raghuram, S., Hill, N. S., Gibbs, J. L., & Maruping, L. M. (2019). Virtual work: Bridging research clusters. *Academy of Management Annals*, *13*(1), 308-341.

More specifically, research themes with respect to team virtuality are covered in more detail in the following review:

Gilson, L. L., Maynard, M. T., Jones Young, N. C., Vartiainen, M., & Hakonen, M. (2015). Virtual teams research: 10 years, 10 themes, and 10 opportunities. *Journal of Management*, *41*(5), 1313-1337.

To better understand how different degrees of team virtuality affect team processes and team effectiveness, we recommend:

Mesmer-Magnus, J. R., DeChurch, L. A., Jimenez-Rodriguez, M., Wildman, J., & Shuffler, M. (2011). A meta-analytic investigation of virtuality and information sharing in teams. *Organizational Behavior and Human Decision Processes*, *115*(2), 214-225.

A concise overview of the multiple theoretical work design perspectives that have evolved over the last 100 years is given in:

Parker, S. K., Morgeson, F. P., & Johns, G. (2017). One hundred years of work design research: Looking back and looking forward. *Journal of Applied Psychology*, *102*(3), 403-420.

In our own research, we also reviewed how work design interventions affect individual, team and organizational performance:

Knight, C., & Parker, S. K. (2019). How work redesign interventions affect performance: An evidence-based model from a systematic review. *Human Relations* (Advanced online publication). Doi: 10.1177/0018726719865604.

More specifically, we have reviewed how work design can be used to leverage virtual team functioning:

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

For more extensive background on the SMART model (including measuring and monitoring SMART work design of your own work):

Parker, S. K & Knight, C (2020). *Higher order factor structure of work characteristics*. Manuscript under review.

https://www.smartworkdesign.com.au