Gordon Institute of Business Science
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Understanding task complexity and shared leadership in virtual project teams

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A research project submitted to the Gordon Institute of Business Science, University of Pretoria, in partial fulfilment of the requirements for the degree of Master of Business Administration.

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Abstract

Over the past several decades, there has been explosive growth in the use of virtual project teams across organisations for the efficient execution of complex tasks to deliver project objectives. This trend is expected to continue, with the Covid-19 pandemic accelerating the growth of these teams even further and possibly forever. However, these multidisciplinary, geographically dispersed teams are presented with additional complexities around advancements in technology, task complexity and shared leadership, necessitating the need for further research into understanding these complexities and how they support virtual project teams in leading to optimal team outcomes. The aim of the study is to understand the role of technology and the requirements of virtual project teams that are supported by shared leadership in order to facilitate their optimised performance, leading to improved team outcomes when performing complex tasks.

An exploratory, qualitative research approach was followed based on non-probability sampling, and semi-structured interviews were performed with members that were part of a virtual project team.

The results revealed that technology was an enabler in the development of these teams. Task complexity affected working in a virtual project team both positively and negatively, while shared leadership supported these teams when dealing with complex tasks. A key finding suggested the need for upfront training in the efficient use of ICT platforms and cloud-based solutions. This training will help bridge the digital divide and improve collaboration and communication, leading to better performance and team outcomes.

This study contributes to literature in the fields of organisational behaviour and leadership theory.

Keywords

Virtual teams, virtual project teams, task complexity, shared leadership, information and communications technology

Declaration

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination to any other university. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

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Glossary

Computer Mediated Communication (CMC): Communication that occurs electronically

Confirmation bias: When people construct a social reality that matches their preconceptions and reinforce already held beliefs

Conflict: The interaction of interdependent people who perceive opposition of goals, aims, values

Digital Divide: The gap between those who have access to modern ICT including the possession of skills to use digital technologies, and those who do not

Information and Communications Technology (ICT): Technological platforms in which team members can connect, communicate and share knowledge

Input-Process-Output (IPO) Framework for Virtual Teams: A useful diagnostic tool to identify the organizational and individual design factors that can help in the understanding of virtual team functioning

Knowledge sharing: The dissemination of knowledge among team members

Psychological safety: When all members in a team feel valued and safe to take interpersonal risks by speaking up about a problem, raising a difficult issue, or simply asking the team for help

Shared leadership: An emergent team property that results from the distribution of leadership influence across multiple team members

Task complexity: The extent to which the tasks on a job are complex and difficult to perform

Virtual project teams: Geographically dispersed team members that combine their efforts to achieve common goals through the use of electronic communication media.

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1. Chapter 1: Introduction to Research Problem

1.1. Introduction

Over the past several decades, technological advancements have enabled unprecedented growth in the use of virtual teams (Zhu & Lee, 2017; Liao, 2017; Eisenberg, Gibbs & Erhardt, 2016; Dulebohn & Hoch, 2017). Dulebohn and Hoch (2017) further cited a survey with respondents from 80 countries where 85% of the respondents worked in virtual teams. Additionally, the Covid-19 pandemic has accelerated this growth even further as people are forced to work from home, leading to a radical shift in virtual collaboration through technology (Waizenegger, McKenna, Cai & Bendz, 2020). Resultant from this, the workplace is also becoming increasingly project centred, allowing for multidisciplinary, geographically dispersed knowledge workers, commonly referred to as virtual project teams, to combine their efforts for the efficient delivery of project objectives while reducing costs (Scott-Young, Georgy & Grisinger, 2019).

With business transformation emanating from the Fourth Industrial Revolution and globalisation, this has necessitated the use of virtual project teams and placed further demand on business capabilities (Eisenberg et al., 2016), both from a perspective of technology as well as technological skills. Exacerbated by the global pandemic, it is through the successful coordination of people in virtual teams and their technological skills that organisations are able to connect to their customers, obtain a competitive advantage by responding with agility to the customer needs, creatively utilise the insights gathered from integrated functions to enhance knowledge sharing, increase the speed at which decisions are made, be innovative and improve productivity (Siebdrat, Hoegl & Ernst, 2009; Alsharo, Gregg & Ramirez, 2017).

Conducting business in a virtual environment is complex on its own and by nature, it is further complicated by the work that needs to be done by virtual project teams. This complexity partly emanates from the advancements in technology having demonstrated that virtual teams present additional challenges of coordination, interaction, collaboration, communication, knowledge sharing and trust between team members and this may be exacerbated by the lack of effective technology and adequate technological skills (Choi & Cho, 2019). Both Alsharo et al. (2017) and Schaubroeck and Yu (2017) indicate that virtual teams are established in response to the increasing demand of having to rapidly solve heightened technically complex

tasks. Furthermore, research indicates that it is highly unlikely for a single team member to have the required knowledge and expertise for these complex tasks (D'Innocenzo, Mathieu & Kukenberger, 2016), necessitating the need to move away from traditional vertical leadership to embrace the notion of shared leadership in virtual project teams (Eisenberg et al, 2016). Ultimately, businesses are not only concerned with managing virtual project teams but also equipping these teams to be productive and effective, leading to better performance and ultimately better team outcomes.

On the other hand, there appears to be limited research on the role of technology within virtual project teams and how it influences task complexity and shared leadership. Morrison-Smith and Ruiz (2020) pointed out that while there is plenty of research on the challenges faced by virtual project teams, there is little research on the role of technology and how it can be used to mitigate some of the challenges faced by virtual project teams. If technology is an enabler of virtual project teams (Choi & Cho, 2019), it is therefore important for one to understand the role it plays and how this role can be harnessed for improved team performance. Similarly, there appears to be minimal research around how shared leadership supports complex tasks (Scott-Young et al, 2019). This research will also add to the existing literature around virtual project teams by exploring how shared leadership interacts with complex tasks in these teams.

1.2. Purpose of Research

The emergence of virtual project teams resulted in changes to traditional teams, where teams are coordinated to solve functional problems over a shorter timeframe. However, this has now evolved to being established as the way in which businesses operate, working across various functions as well as responding to customer demands, which ultimately results from advancements in technology (Dulebohn & Hoch, 2017; Alsharo et al., 2017; Schaubroeck & Yu, 2017). Amidst the range of the challenges described earlier within virtual project teams, this study will be conducted using the Input-Process-Output (IPO) Framework for virtual teams as the backbone (Dulebohn & Hoch, 2017), promoting a rich integrated approach across all levels of business. The framework of virtual teams studied in conjunction with the "effects approach" allows for a better understanding of how technology affects team processes (Gibbs, Sivunen & Bovraz, 2017).

Information and Communication Technology (ICT) as well as Computer Mediated Communication (CMC) become enablers of connecting virtual teams through various technological platforms in which team members can connect and share knowledge and insights as well as organise and coordinate the work that the team needs to perform (Choi & Cho, 2019). ICT can either enhance performance or have no effect on virtual project teams (Han, Hiltz, Fjermestad, & Wang, 2011). Dulebohn and Hoch (2017) contrast this view by indicating that the manner in which ICT is structured for virtual teams can result in delays in knowledge sharing and impact negatively on the performance of teams. These contrasting views necessitate further research into understanding the effects of ICT on team processes in virtual project teams.

Furthermore, Maynard and Gilson (2014) highlight that virtual teams perform differently on tasks of varying complexity. Task complexity is said to moderate the IPO pathways in virtual project teams, affecting the direction and/or strengths in the framework (Dulebohn & Hoch, 2017). Evaluating task complexity is relevant for virtual project teams as they are often formed to address complex tasks by including cross functional team members. While a combination of these knowledge workers may allow for these teams to reduce challenges associated with performing complex tasks, they tend to experience fewer opportunities to form relationships with each other, interact informally and engage in knowledge sharing (Eisenberg et al, 2016). This poses a significant problem as complex tasks, by their very nature, are said to require higher levels of trust, greater levels of cooperation, coordination and knowledge sharing (Choi & Cho, 2019). Moreover, Hoch (2013) suggested that team goals can only be achieved when virtual teams have a common understanding of the business requirements.

To build on the limited existing research in this area, Gilson et al. (2015) claim that lack of interpersonal trust may result in team members not sharing their knowledge adequately with other team members. The general lack of trust or confidence in the use of technology may affect the performance of teams, thus it is important to explore the critical role that ICT plays in coordinating work and facilitating knowledge sharing (Orhan, Rijsman & Van Dijk, 2016). Furthermore, understanding interdependencies in virtual project teams presents opportunities for organisations and managers to better manage virtual project teams, a challenge that is inherent in teams that are not located in one area, thereby making this study crucial to leading virtual project teams that are required to solve complex tasks.

This study is also important as it provides an opportunity to understand task complexity in the context of businesses operating virtually, enabled by a specific type of leadership style. Research indicates that shared leadership creates self-managed teams that require greater collaboration (Eisenberg et al., 2016; Fausing et al., 2015; Wu, Cormican & Chen, 2020) as the team members collectively exert leadership influence to solve complex problems, broadening available knowledge resources, sharing responsibilities, guiding each other and making decisions that reduce challenges faced by businesses (Hoch & Kozlowski, 2014). Through a review of shared leadership studies across a range of team types, Scott-Young et al. (2019) concluded that research on shared leadership in project teams had been poorly developed despite studies conducted across various types of teams, all which have the potential to enhance performance. This has motivated the necessity to further explore the reasons behind the role of shared leadership in performing complex tasks across virtual project teams as its emergence and relevance remains pertinent to ensuring optimal performance in organisations.

Ultimately, the study aims to seek and understanding into the requirements of team members in order to enable effective coordination and facilitate optimised performance that leads to better team outcomes in virtual project teams that are supported by shared leadership when performing complex tasks. By understanding these requirements, organisations can formulate effective training programs to improve team outcomes in virtual project teams. The study will further assist organisations in formulating optimal teams that can help to foster the development of shared leadership to achieve better team performance (Dulebohn & Hoch, 2017; Fausing et al., 2015), which is fundamentally the goal of any organisation (D'Innocenzo et al., 2016; Zhu & Lee, 2017). Furthermore, this study will make an academic contribution towards the disciplines of organisational behaviour and leadership theory by providing insights into the role played by technology as well as the requirements of task complexity and shared leadership within virtual project teams and how they can be harnessed for positive outcomes.

1.3. Research Problem

Based on the research problem identified, the purpose of this study is to gain a deeper understanding into the role of technology in a virtual project teams' environment, explore the requirements of complex tasks within these teams and

understand how shared leadership can support these requirements in order to create successful workflow in virtual project teams to meet their objectives.

To summarise, the study aims to:

- Understand how technology plays a role in developing these multidisciplined virtual project teams;
- Explore the requirements of complex tasks in virtual project teams; and
- Understand how the sharing of leadership can support the requirements of complex tasks in virtual project teams.

By gaining a better understanding of the above, organisations can formulate effective training programs and optimal teams that can achieve their goals seamlessly when working in a virtual project team environment.

1.4. Conclusion

The literature review focuses on the role of technology as well as the requirements of task complexity and how shared leadership can be of support within virtual project teams. The research aims to benefit to business leaders by providing practical insights to effectively manage virtual project teams in this digital era where business is conducted beyond physical boundaries. In addition to this, the study will identify the necessary requirements and competencies needed by team members in order to enable effective coordination and facilitate optimised performance in virtual project teams so that effective training programs can be formulated to improve team outcomes. The study will also assist organisations to formulate optimal teams that can help to foster the development of shared leadership to achieve better team performance (Dulebohn & Hoch, 2017; Fausing et al., 2015), which is ultimately the goal of any organisation (D'Innocenzo et al., 2016; Zhu & Lee, 2017). This demonstrates the need for businesses to understand how virtual project teams can successfully manage task complexity through shared leadership without suffering the loss of costs, time and a competitive advantage which emanates from diminished productivity as it is more difficult to manage virtual teams (Gibson & Gibbs, 2006). The study will also make an academic contribution towards the disciplines of organisational behaviour and leadership theory.

2. Chapter 2: Literature Review

2.1. Introduction

This chapter introduces literature relating to virtual project teams as well as the associated concepts. The chapter begins by laying the foundation towards a better understanding of virtual project teams. Concepts related to virtual project teams that are specific to this research, such as ICT, task complexity and shared leadership, are also presented.

2.2. Virtual Project Teams

2.2.1. Background and Understanding

Dulebohn and Hoch (2017) defined virtual project teams as work arrangements coordinated for knowledge workers to work independently, enabling continuous productivity where team members are geographically dispersed across boundaries but combine their efforts to achieve common goals through the use of electronic communication media. These are teams that are not hierarchical like traditional teams but are rather more flexible. An interesting consideration in this definition is the complexity of how these teams are "assembled using a combination of telecommunications and information technologies to accomplish an organizational task" (Maduka, Edwards, Greenwood, Osborne & Babatunde, 2018, p697). These multi-skilled teams of knowledge workers achieve their goals and objectives by connecting through digital media to communicate due to limited face-to-face interactions.

Globalisation has seen the removal of many barriers to how business is conducted through accelerated growth and advancement in technology (Liao, 2017). Waizenegger et al. (2020) alluded to the importance of considering the impact of the shift from the traditional working environment of physical offices to remote working, in order to compete globally. Markets demand organisations to be fast, agile and responsive in an ever-changing environment to maintain a competitive advantage through various teams performing their core work (Barnwell, Nedrick, Rudolph, Sesay & Wellen, 2014; Nordbäck & Espinosa, 2019).

It is evident that the popularity of virtual teams is expected to continue rising as a result of rapid technological advances (Eisenberg et al., 2016). The Fourth Industrial Revolution has led to the accelerated use of virtual teams and today, virtual teams

have fast become the new normal following the global Covid-19 pandemic, which necessitated the adoption of new operating models, with technology as an enabler of business operations but also as an integral part to ensuring business continuity and sustainability (Dulebohn et al., 2017; Eisenberg et al., 2016; Liao, 2017; Waizenegger et al., 2020; Zhu & Lee, 2017).

In order to have a full appreciation of the use of virtual teams, understanding the historical context of how teams used to operate is important. According to Alsharo et al. (2017), virtual teams were initially established for shorter periods and intended mainly for acquiring insights and knowledge to rapidly solve complex or non-routine problems. Schaubroeck et al. (2017) also indicated that organisations are increasingly using virtual project teams in order to respond to the rising demands associated with rapid environmental changes, globalisation and heightened technical complexity.

Gibbs et al. (2017) conducted a review on research that had been published over 15 years and identified cultural composition, technology use and leadership conditioned by team type and design to be the focus dimensions around virtual teams' literature. Virtual teams are designed for short-term or long-term use and can constitute either functional teams, consisting of people with similar skill sets within one discipline or project-based teams consisting of knowledge workers from various disciplines (Dulebohn & Hoch, 2017). These teams are growing in complexity based on their multidisciplinary organisation, significantly raising an interest in this research as the world is increasingly adapting this mode of work (Hoegl & Muethel, 2016; Scott-Young, et al., 2019). The complexity stems partly from diversity of the team composition that may affect team performance as a result of different environments (Eisenberg, Post & DiTomaso, 2019). The effects of ICT usage in virtual project teams were found to be contradictory, showing both benefits and challenges. In addition to this, literature around leadership in virtual teams has received significant attention, resulting from the central role it plays in overcoming virtual team challenges (Gilson et al., 2015). The benefits and challenges of virtual project teams are presented below.

2.2.2. Benefits and Challenges of Virtual Teams

The significance of virtual project teams lies on the tenet that they can be an organisation's competitive advantage (Siebdrat, Hoegl & Ernst, 2009). Benefits

include their ability to function flexibly, integrate various functions for organisational insights which facilitates innovation (Siebdrat et al., 2009), promotes knowledge sharing (Alsharo et al., 2017), reduces office-space, time and travel costs, allowing work-life balance, improving decision-making speed and increasing productivity from role clarification as project objectives are linked to the skills and capacity of the virtual project teams (Eisenberg et al., 2016). Furthermore, it is also interesting to note that as a result of less travel required in these teams, team members are able to work greener and increase their awareness of green solutions and innovations (Olaisen & Revang, 2017).

The benefits described above are, however, not void of challenges. Morrison-Smith and Ruiz (2020) highlighted the challenges faced by virtual project teams to include the management of diverse team members, which results in collaboration and communication difficulties, low levels of media richness, lack of verbal cues resulting in confusion and misunderstandings (Zhu & Lee, 2017), motivational sense of presence due to distance and members feeling isolated, technical competence and infrastructure access, the nature of work resulting from the perspective of task complexity as well as the explicit leadership and management styles employed for remote working. This amplifies the onerous responsibility of leadership in facilitating the workflow in virtual project teams to successfully meet the goals and objectives of the business as they execute core work virtually (Larson & DeChurch, 2020). Virtual teams need to be adjusted regularly to meet business' changing needs and require more time to develop trust and build social relations within limited timeframes. Specific concepts relating to the benefits and challenges of virtual project teams are discussed below.

2.2.2.1. Communication

According to Sillars and Vangelisti (2018), communication is seen and interpreted differently within different spheres. They argued that within the academic sphere, communication is "seen as a pattern of interconnections" (Sillars & Vangelisti, 2018, p.243). On the other hand, in terms of the study of personal relationships, "communication is seen as the means by which people construct and maintain relationships, along with a set of skills or skill deficits that contribute to relationship adjustment" (Sillars & Vangelisti, 2018, p.243).

These two perspectives are important within virtual project teams. Indeed, these teams do engage in multiple patterns of interconnections, primarily enabled by technology, to construct and maintain relationships within the team, towards achieving common goals. In concurring with Sillars and Vangelisti, Laitinen and Valo (2018, p.12) added that "communication technology is an essential part of virtual teams." They further elaborated that modern technology not only "enable[s] multiple, often geographically dispersed, participants to communicate simultaneously, but also facilitates multiple communication functions, such as information sharing, negotiating, problem-solving and team decision-making." Laitinen and Valo (2018, p.13). It is therefore clear that virtual project teams have an inherent need to communicate. Communication brings about benefits such as the sharing of information and knowledge, improved problem-solving and enhanced team collaboration.

Challenges to communication within virtual project teams include the loss of non-verbal cues such as facial expressions, hand movements as well as tone of voice (Popescu & Warmenhoven, 2019). In face-to-face communication, it is easier to see these non-verbal cues and one is then able to adjust their response accordingly. Technology itself brings about communication challenges within virtual project teams. These range from incompatibility with software and hardware to technology literacy levels among team members (Hadjiev, 2018).

2.2.2.2. Collaboration

Scoular, Duckworth, Heard and Ramalingam (2020, p.2) defined collaboration as "the capacity of an individual to contribute effectively in a group. This involves perseverance, contributing to team knowledge, valuing contributions of others and resolving differences." This definition is based on communication being the backbone where team members must be willing to communicate and contribute to the project at hand, with the aim of establishing common understanding of the team goals as well as contributing towards solutions to achieve the set goals. Choi and Cho (2019) further concurred that collaboration is about cooperation, coordination and knowledge sharing. Morrison-Smith and Ruiz (2020) proposed that constant communication enhances collaboration, establishes boundaries and defines roles and responsibilities to mitigate the risk of work duplication, misalignment between teams and foster the changing team culture as a result of remote working. Interestingly, Dulebohn and Hoch (2017) argued that the manner in which

technology-mediated collaboration is established can result in delays in knowledge sharing, impacting negatively on the performance of teams.

2.2.2.3. Confirmation Bias

According to Workman (2018), confirmation bias occurs when people construct a social reality that matches their preconceptions and already held beliefs. This construct of a social reality may happen at both individual and team level (Cassell, Dearden, Rosser & Shipman, 2019). Kappes, Harvey, Lohrenz, Montague and Sharot (2020, p3) added that "humans are inclined to discount information that contradicts past judgements [and] are more influenced when others express judgements with high confidence than low confidence." Gatlin, Hallock and Cooley (2017) found that confirmation bias may have a negative impact on the accuracy and quality of decision-making within a team. In their study titled *The Effect of Confirmation Bias on Auditors' Risk Assessments: Archival Evidence*, Cassel et al (2019) found that auditors were more likely to rely on their confirmation bias when dealing with existing clients and therefore assess the client's risk as low even where there have been changes that indicate higher risk. Confirmation bias may particularly be a challenge in virtual project teams that consist of expert knowledge workers, with some team members domineering over others as a result of their own belief that they are the subject matter experts. This may lead to poor decision-making and, in some cases, even disengagement by some team members.

2.2.2.4. Conflict

Sasikala, Santhiya and Swetha (2021, p.4750) defined conflict as "the interaction of interdependent people who perceive opposition of goals, aims, values and who see other parties as potentially interfering with the realization of these goals." This aligns with the definition of virtual project teams being teams consisting of knowledge workers formed to work independently, enabling continuous productivity with the possibility of team members being geographically dispersed across boundaries but combining their efforts to achieve common goals through the use of electronic communication media (Dulebohn & Hoch, 2017). The common denominator between these definitions is the achievement of common goals. While a virtual project team may have a common goal, conflict will occur across team members as a result of some team members standing in the way of achieving such team goals.

Turesky, Smith and Turesky (2020, p.188) argued that “conflict tends to occur more in [virtual teams] rather than in traditional, proximal teams [and] these resulting increases in conflict are thought to underlie declines in performance.” They further added that conflict in virtual project teams may arise as a result of the virtual nature (technology) of the team and that this nature may escalate the conflict or lead to conflict avoidance, which in turn affects performance negatively. To address this challenge, the authors proposed that virtual project team members “address conflict with time urgency and a direct, honest and transparent approach” (Turesky et al. 2020, p.202).

2.2.2.5. Digital Divide

It is impossible to talk about virtual project teams within the African context, without discussing the digital divide. This is often loosely referred to as the gap between those who have access to modern ICT and those who do not. However, Lembani, Gunter, Breines and Dalu (2020) argued that the concept of digital divide also involves the possession of skills to use digital technologies in a meaningful way. This definition is important as there is an underlying assumption that team members who are placed in virtual project teams possess both the necessary infrastructure and skills to use technology for such platforms and that they have access to the same broadband internet. Nyahodza and Higgs (2017, p.39) concurred to this point and stated that “factors that contribute to the digital divide include lack of ICT infrastructure, lack of or low internet connections, lack of skills, and high levels of poverty.”

Rogers, Madden, Grubb and Karriker (2020) posited that the digital divide is inherent within virtual project teams. They argued that “the inherent “digital divide” separating virtual team members can dampen the development of intrateam cohesion, trust and communication” (Rogers, Madden, Grubb & Karriker, 2020, p.1). This is because virtual project teams “work behind a virtual curtain to build relationships without in-person meetings” (Rogers, Madden, Grubb & Karriker, 2020, p.4). If not properly managed, the digital divide can stifle social interactions that have the potential to increase affective bonds, member effort and team commitment.

2.2.2.6. Human Interaction

Lechner and Mortlock (2021) explained human interaction in virtual teams as the ability to ‘see the human behind the screen’, getting to know the human and building

high-quality relationships. They found that the human factor can easily get lost in virtual project teams as communication and interaction is limited to different technologies and teams hardly get to meet face to face (Lechner & Mortlock, 2021). Hadjiev (2018) added that the lack of physical interactions in virtual project teams can lead to contamination of communication and misunderstanding of the messages communicated through the various technology platforms. This is a potential challenge, especially when working on complex tasks where common understanding is critical (Hoch, 2013). Eisenberg et al. (2016) argued that virtual team members often feel isolated and detached as a result of reduced face-to-face interactions. Shaik and Makhecha (2019) found that such feelings of isolation often led to team members sharing less emotions, craving for belongingness and appreciation. In such circumstances, team performance may be negatively impacted.

To mitigate this potential loss of intimacy, Lechner and Mortlock (2021) proposed that team members need to demonstrate genuine interest in each other by asking the right questions and by understanding that all team members have similar human needs and that our shared experiences can bring us together. The authors also added that team members could also share appropriate personal information as well as create new experiences together (Lechner & Mortlock, 2021).

2.2.2.7. Consensus

Mach and Baruch (2015, p.7) posited that “consensus about collective team orientation can be understood as differences among members in their perceptions regarding the way teamwork should function.” Scholars agree that reaching consensus in virtual project teams can be a challenge (Peng, Lurie & Slaughter, 2019). Peng et al. (2019, p.949) also added that “lack of consensus is a critical challenge in teams of diverse individuals.” The diversity within virtual project teams can be brought about by culture, environment, work ethic, language and other aspects.

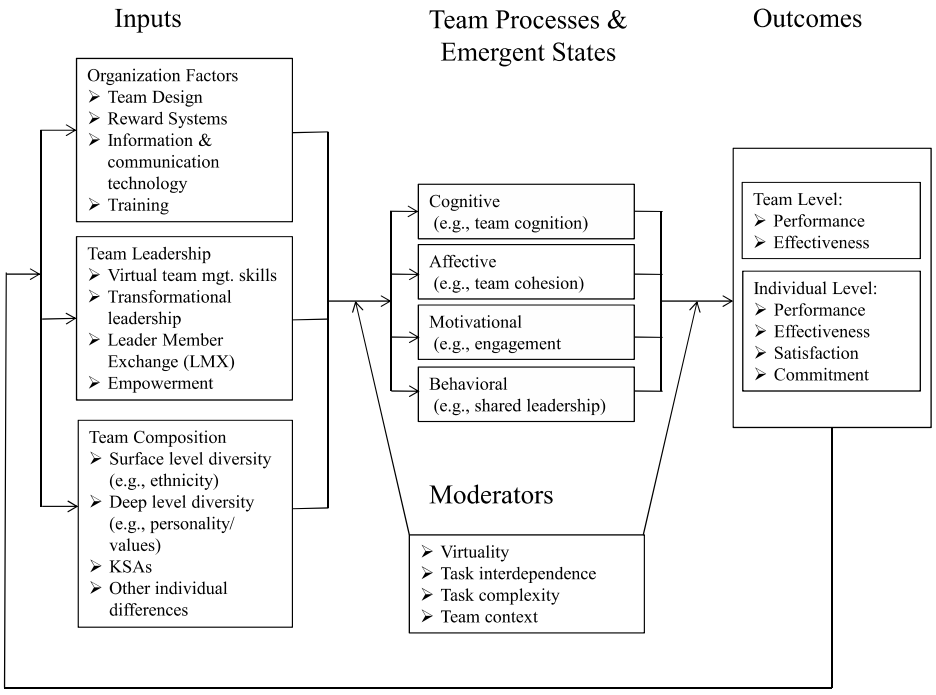
To overcome some of the challenges around team consensus, Mach and Baruch (2015, p.2) proposed that “in order to foster team consensus and overcome the effects of group members’ cross-cultural dissimilarities and team fault lines, organisations should invest in improving members’ dedication, cooperation and trust before looking to achieve significant results, particularly in heterogeneous teams and cross-cultural contexts.” In their respective studies, the above authors have found

that in some cases, consensus among virtual project team members is low at the beginning, when team members are still getting to know each other (Mach & Baruch, 2015; Peng et al., 2019). To this end, they proposed that both team members and team leaders need to be patient and seek to create a suitable environment to strengthen the ability to gain consensus as opposed to chasing high quality outputs. The authors have also found that the appropriate use of technology can aid in improving the levels of consensus among virtual project team members.

2.2.3. IPO Framework for Virtual Teams

Figure 1 below is drawn from Dulebohn and Hoch (2017) and represents a conceptual input-process-output (IPO) framework. Initially developed to research face-to-face teams, this framework has recently been adapted for virtual teams as well (Hoch & Kozlowski, 2014). Most researchers propose the adoption of the IPO framework to identify the critical inputs, emergent states and team processes, moderators and outcomes for both team and individual level effectiveness and performance in virtual teams. In addition to this, Liao (2017) advocates for a multilevel approach to be taken when studying leadership in virtual teams as he believes that leadership functions at both team and individual levels.

Figure 1: Input-Process-Output Model of Virtual Teams



Source: Dulebohn & Hoch (2017)

The IPO framework is a useful diagnostic tool to identify the organisational and team inputs referring to the organisational design factors of virtual teams, such as the team size, purpose, scope, work environments, ICT and training, team leadership requirements (skills and behaviours that facilitate team engagement and influence) and team composition, which describes the diversity of the team. The team processes describe the cognitive, affective, motivational and behavioural requirements such as shared leadership. Moderators are considered to be factors that affect the direction or strengthen or weaken the relationships in the model (Dulebohn & Hoch, 2017), such as task complexity. These process factors ultimately determine the effectiveness of the team and its individuals and the output thereof. Hence, this IPO model will be used in this study to understand the factors that may contribute towards, or negate, effective team outcomes.

2.2.4. ICT in Virtual Teams

With research dating back just over ten years, Gilson et al., (2015) have identified ICT as having played a paramount role in connecting teams and removing geographic boundaries. They maintained that ICT has raised an interest in the themes pertaining to working in a digital environment, such as virtual teams, performance inputs that enable team success, virtuality and shared leadership, among several others (Gilson et al, 2015). Orhan et al. (2016) brought to attention that ICT has the potential to affect virtual team performance positively by improving communication and collaboration across space and time. On the other hand, Dulebohn and Hoch (2017) argued that it can also affect teams negatively due to communication and collaboration difficulties.

In their research, Gibbs et al. (2017) described the “effects” approach as being one of the methods of understanding how the use of technology can affect virtual project teams and its members by treating technology as an input or mediating variable affecting team processes and outcomes either positively or negatively. Their research cited that the use of technology has an effect on the development of common understanding and goals, information and knowledge sharing as well as poor communication in virtual teams, however, these findings were mixed. Furthermore, in their research, Gilson et al. (2015) described how CMC can help team members to overcome time, space and organisational boundaries and reduce social loafing. Moreover, challenges associated with complex tasks can improve when multiple CMC options are leveraged (Gilson et al., 2015). However, in contrast

to this, Eisenberg et al. (2016) argued that CMC reduces the effectiveness of communication and leads to feelings of isolation as a result of decreased individualisation in virtual project teams.

Virtual team communication and collaboration are, to some extent, technology-mediated, resulting in both the use of appropriate communication technologies as well as ways of utilising the technology being essential for successful team interaction (Hovde, 2014). As described earlier, technology can either enable or stifle communication, collaboration, consensus, trust and the digital divide. According to Alsharo, Gregg and Ramirez (2017, p.40) “trust includes elements of risk, vulnerability, and uncertainty which team members must overcome in order to work collaboratively”. They also identified trust as positively influencing collaboration within virtual project teams, however, trust did not have a significant impact on team effectiveness. This means that while team members collaborate better when trust is present, a lack of trust did not necessarily mean they could not perform.

2.3. Task Complexity

Müller, Pintor and Wegge (2018) defined task complexity as the “extent to which the tasks on a job are complex and difficult to perform” based on the characteristics of those tasks. Choi and Cho (2019) alluded to task complexity as being a critical factor that shapes relationships and interactions between team members in virtual teams. Gilson et al. (2015) highlighted how virtual teams perform differently on tasks of varying interdependence and complexity, considered as moderators between the inputs and outputs of virtual teams in the IPO model. Multiple researchers have identified task complexity as a moderator considered to affect the relationships in a virtual team process (Choi & Cho, 2019; Dulebohn & Hoch, 2017; D’Innocenzo et al., 2016; Liao, 2017; Scott-Young et al., 2019).

Complex tasks often require cross-functional team members to coordinate their diverse skills to synthesise their knowledge in order to solve problems (Eisenberg et al., 2016; Hoegl & Muethel, 2016; Krumm, Kanthak, Hartmann & Hertel, 2016). To effectively reach a common goal, teams need to be aligned and share a common understanding regarding the requirements of the task, which will in turn determine how their work is coordinated.

Zhu and Lee (2017) discussed the importance of setting goals and prioritising tasks when dealing with task complexity in virtual teams. Additionally, Eisenberg et al. (2016) stated that virtual teams can assist in reducing challenges associated with complex tasks as a result of time available to digest information and ideas, leading to fewer disagreements when working virtually. However, they argue that creating relationships, interacting informally, engaging in knowledge sharing and brainstorming ideas to foster creativity may not be possible in these teams. Consequently, Marlow, Lacerenza and Salas (2017) advocated for further research into task complexity based on conflicting results from various team types. In addition to this, while Choi and Cho (2019) confirmed that virtual teams performing complex tasks exhibit greater trust, cooperation, coordination and knowledge sharing than teams performing simple tasks, they advocate for further studies into understanding team interactions and other contextual factors that may exist when dealing with complex tasks in virtual teams.

Hoch and Kozlowski (2014) recognised that complex tasks require greater coordination, greater communication and increased shared leadership to facilitate knowledge sharing and influence team engagement for synchronous communication and this in turn establishes trust between team members. Additionally, how the team communicates becomes critical to their success as certain modes of communication are not effective for resolving challenging tasks (Hunsaker & Hunsaker, 2008). Morrison-Smith and Ruiz (2020) proposed that constant communication enhances collaboration, establishes boundaries and defines roles and responsibilities to mitigate the risk of work duplication, misalignment between teams and foster the changing team culture as a result of remote working. Notably, D'Innocenzo et al. (2016) advised that as task complexity increases, the benefits of shared leadership become more visible due to the unlikeliness of one person having all the abilities to lead the team. D'Innocenzo et al. (2016) alluded to how community concepts that foster collaboration in turn lead to collective consciousness in individuals and therefore establish trust, humility, integrity, compassion and humanity, all of which are necessary for productive teams but are very much behavioural aspects.

2.3.2 Knowledge Sharing

Rosen, Furst and Blackburn (2007, p.260) defined knowledge sharing as "the dissemination of existing knowledge among team members and bringing new

knowledge into the team from the external environment." This then requires team members to be actively involved and engaged on the team objectives so they can participate and provide input into brainstorming and decision-making.

Alsharo, Gregg and Ramirez (2017) found that knowledge-sharing positively influences trust and collaboration within virtual project teams. Hong and Vai (2008) discovered that knowledge-sharing within virtual project teams relies on shared understanding as well as the learning climate. This proposes that having a common understanding (which comes through constant communication) together with an environment that encourages knowledge-sharing is critical to improved collaboration among virtual team members. Davidavičienė, Majzoub and Meidute-Kavaliauskiene (2020, p3) argued that "knowledge-sharing can be unsuccessful due to many reasons, such as a lack of technological resources and personal motivation, difference in individual skills, and a lack of organizational support and training." To mitigate this, the authors proposed that careful attention should be paid towards the management of ICT, trust, leadership, culture and conflict.

2.3.3 Psychological Safety

According to Lechner and Mortlock (2021, p.1), psychological safety is when all team members feel valued and safe by taking "interpersonal risks [and] can refer to speaking up about a problem, raising a difficult issue, or simply asking the team for help." From this definition, it is clear that a safe space needs to be fostered for virtual team members to be vulnerable and confront uncomfortable discussions, especially when dealing with complex tasks. Frazier, Fainshmidt, Klinger, Pezeshkan and Vracheva (2017) found that leadership, employee engagement, task performance, satisfaction, and commitment were crucial in fostering psychological safety. Rosen, Furst and Blackburn (2007, p.267) argued that "virtual team leaders have a responsibility to facilitate knowledge-sharing by creating a team culture in which members feel safe to share ideas, offer constructive criticism, and ask other team members for help when needed." While Rosen, Furst and Blackburn (2007) advocate for leadership to create these safe spaces, Lechner and Mortlock (2021, p5) added that "shared context, in turn, helps create psychological safety by increasing mutual understanding and establishing common behavioural norms." Therefore, it is vital for virtual team members to share not only a common vision, but also a common context.

2.4. Shared Leadership

Despite traditional vertical leadership styles of having one leader in a team having existed for generations, recent studies are increasingly advocating the benefits of shared leadership as being more effective across virtual team contexts with greater task complexity (Cao, Xu, Liang, & Chaudhry, 2012; Eisenberg et al., 2016). According to Scott Young et al. (2019), studies on shared leadership across all disciplines are limited and under-developed, with minimal studies being performed in virtual project teams despite this leadership style having the potential to enhance both project team functioning and performance. Although there are other leadership styles that may emerge within virtual project teams (Dulebohn & Hoch, 2017; Gilson et al., 2015), the scope of this research is limited to shared leadership due to its effectiveness across virtual team's literature, where there is greater task complexity (Cao, Xu, Liang, & Chaudhry, 2012; Eisenberg et al., 2016).

2.4.1. Definition of Shared Leadership

This study will adopt the definition of shared leadership based on the sample type of Master of Business Administration (MBA) student teams which is defined as "*an emergent team property that results from the distribution of leadership influence across multiple team members*" and is distinguished by access and knowledge-sharing between team members (Carson, Tesluk & Marrone, 2007; Scott-Young et al., 2019). Hoch (2013) indicated how this knowledge-sharing fosters innovation and problem-solving as shared leadership is characterised by collaborative decision-making and shared responsibility for better outcomes.

According to Scott-Young et al. (2019), shared leadership occurs when team members experience the distribution of leadership influence among all team members, meaning, when all team members experience being a leader as well as being led in a team. Liao (2016) added that shared leadership occurs when those elected to lead specific projects within a team have the responsibility to coordinate such tasks by assigning specific tasks to members and ensuring regular progress is shared with the rest of the team members.

From Hoch (2013), Scott-Young et al. (2019) and Liao (2016), it then follows that shared leadership emerges when there is a task at hand or problem to be solved. In such circumstances, the virtual project team would then organise in such a way that

leadership influence is distributed among all team members and tasks are allocated appropriately towards solving the problem or completing the task at hand.

2.4.2. Measurement of Shared Leadership

Scott-Young et al. (2019) identified varying definitions of shared leadership across different team types which resulted in differing measurement approaches due to the lack of its conceptual clarity and coherence. This is because shared leadership has previously been measured as a static phenomenon, ignoring the fact that projects, roles and relationships between team members emerge, co-evolve and change throughout the project lifecycle (D'Innocenzo et al., 2016). The aggregation measure calculates the mean team members' perception of their collective participation whereas the Social Network Analysis (SNA) measure calculates both the links between team members, known as the density score and the distribution of leadership within the team, known as the centrality score (Eisenberg et al., 2016). D'Innocenzo et al. (2016) suggested that SNA was a better measure than aggregate methods and had a stronger relationship to team outcomes, however, this measure produced different results with larger effect sizes (Scott-Young et al., 2019). Interestingly, Wang et al. (2014) argued that these measurement approaches had no influence on the relationships, leading to contrasting opinions.

2.4.3. Shared Leadership as a Dynamic, Emergent Process

A view adapted by many scholars emerges from the work of Pearce and Conger (2003) who defined shared leadership as an iterative and "dynamic, interactive influence process" intended to achieve organisational goals by sharing leadership responsibilities within a team, and where all team members influence each other to achieve this goal (Zhu & Lee, 2017). Hoch (2013) supports shared leadership as being suitable for competitive environments due to its dynamic nature. In agreement with this emergent perspective, Dulebohn and Hoch (2017) identified shared leadership as a dynamic state that unfolds over time. Lorinkova and Bartol (2021) further alluded to how shared leadership is progressive in that it develops with the teams over the project life cycle. Scott-Young et al. (2019) also conceptualised shared leadership to be a dynamic emergent process that unfolded over time and recommend the adaption of the IPO framework to capture shared leadership as an emergent process. Particularly in the context of projects, roles and relationships between team members emerge, co-evolve and change throughout the entire life cycle of the project as a result of leadership in project teams being based on

knowledge, task expertise and competence in order to foster efficient project team functioning (Scott-Young et al., 2019).

2.4.4. Shared Leadership as a Multilevel Process in the IPO Framework

According to Liao (2017) and Scott-Young et al. (2019), leadership in virtual teams adopts a multilevel perspective based on the phenomenon that leadership functions at both the team level and individual level. The IPO framework outlined in Figure 1 will be used to explore the input factors and outcomes of shared leadership in virtual teams and how they support task complexity.

2.4.5. Empathy

Riess (2017, p.76) defined empathy as “a complex capability enabling individuals to understand and feel the emotional states of others, resulting in compassionate behaviour.” Depow, Francis and Inzlicht (2021) concurred that empathy involved sharing of emotions, perspective taking and compassion. Based on these definitions it is expected that virtual team members will show empathy towards one another, especially in cases where they may be facing challenges, they may need to work on complex tasks or where they need to have difficult conversations.

According to Quisenberry (2018, p.24), “empathy is highly regarded as a key attribute of informal leaders that emerges from self-managed groups and ultimately helps steer projects along.” This perspective brings about leadership, which, according to the authors, emerges from self and then manifests within a group.

2.5. Significance of Task Complexity and Shared Leadership in Virtual Project Teams

With improved productivity, better performance and better team outcomes as the ultimate goal of organising capabilities within a working team (Cao et al., 2012), the success of virtual teams is attributed to the way in which capabilities are organised in order to perform tasks and meet the strategic objectives of the business. This coordination of capabilities is a function of the leadership styles employed to contribute to the effectiveness and successful strategic implementation of projects (Eisenberg et al., 2016). Due to the nature of interdependence that results from the reliance of each team member’s expertise, there is an improvement in collaboration, cooperative behaviours, interactions and solidarity towards team members is improved, and errors are reduced significantly as enabled by the rotation of leadership required in shared leadership (Fausing et al., 2015).

Eisenberg et al. (2016) stated that shared leadership helps meet the need for coordinated efforts, resulting in a natural connection to task complexity in teams, which further fosters trust, improves communication and cohesion due to the bonds that result from the shared leadership. Their research also described shared leadership as being more effective in teams with greater task complexity as a result of greater trust and cohesion from strong bonds created by team members. The measurement of shared leadership therefore requires the evaluation of the influence within the team, the effectiveness of the communication, the quality of decision-making, the knowledge sharing and autonomy (Choi & Cho, 2019). Furthermore, a systematic review of shared leadership by Sweeney, Clarke and Higgs (2019) highlighted the agreement across many scholars that the effects of shared leadership are stronger when work is more complex. Complex tasks cannot be led by a single person, by their very nature of requiring multiple knowledge workers with varying expertise to work on them collectively (Müller et al., 2018). This is confirmed by D'Innocenzo et al. (2016) who identified that it is unlikely that a single person would possess the knowledge and expertise required to solve complex tasks so shared leadership would be beneficial. However, the authors also stated that as tasks become more complex, shared leadership may be too difficult to manage, thus leading to contradictory outcomes.

2.6. Research Questions

It is vital for researchers to examine ways in which team members use and understand ICT and what it can afford in terms of improving the achievement of team goals when performing complex tasks (Gibbs et al., 2017; Gilson et al., 2015). This can assist organisations to realise the importance of training team members on the effective usage of these specific tools or platforms. Furthermore, by gaining an understanding of task complexity and shared leadership in virtual project teams, team members can be trained adequately to improve their effectiveness when working with complex tasks virtually through the support of shared leadership. Ultimately, a better understanding of the requirements of virtual project teams that perform complex tasks, with the support of shared leadership, can help organisations to design optimal teams that can perform effectively in order to achieve their goals seamlessly.

2.7. Conclusion

Globalisation, advances in technology and the Fourth Industrial Revolution have accelerated the growth of virtual teams, with numerous studies advocating their popularity and use that will continue to rise (Dulebohn & Hoch, 2017; Eisenberg et al., 2016; Liao, 2017; Zhu & Lee, 2017). However, despite their many advantages, they are also associated with numerous challenges. This is because the replacement of physical presence with sophisticated technological advancements is not sufficient as the use of technology is said to affect team members and virtual team processes (Gibbs et al., 2017).

With task complexity said to moderate the IPO pathways in virtual project teams, it becomes necessary to understand its role (Choi & Cho, 2019; D'Innocenzo et al, 2016; Liao, 2017;). Virtual project teams' literature suggests that task complexity has certain requirements in these teams, such as coordination and communication, which can affect team effectiveness and performance (Hoch & Kozlowski, 2014). Also, under these conditions, the most effective leadership style has been advocated to be shared leadership (Scott-Young et al., 2019). To reap the significant benefits that the formation of optimal virtual project teams can provide through the effective use of ICT, it is critical to understand the role of task complexity and shared leadership in these teams.

3. Chapter 3: Research Questions

This chapter presents the research questions that have been formulated based on the research problem identified in Chapter 1 along with the literature reviewed and discussed in Chapter 2.

The first research question has been established in order to gain deeper insights into the role of ICT and how it can affect the development of virtual project teams. The other two research questions aim to provide an understanding of how to formulate optimal teams by exploring the requirements of complex tasks and understanding how shared leadership can support these requirements in order to create successful workflow and better team outcomes.

Research Question 1: How does technology play a role in the development of virtual project teams?

The effects of ICT usage in virtual project teams were found to be contradictory, showing both benefits and challenges. While Orhan et al., (2016) stated that ICT has the potential to affect virtual team performance positively, Dulebohn and Hoch (2017) argued that it can affect teams negatively. With ICT being a key input factor in the IPO framework of virtual teams as presented in Figure 1, it is vital to understand its role in the development of virtual teams and how it may contribute towards, or negate, effective team outcomes. A better understanding of ICT and its role in the development of virtual project teams will allow for the utilisation of technology as an enabler of better communication and collaboration leading to better team outcomes.

Research Question 2: How does task complexity affect working in a virtual project team?

Choi and Cho (2019) alluded to task complexity as being a critical factor that shapes relationships and interactions between team members in virtual teams. While Eisenberg et al. (2016) stated that virtual teams can assist in reducing challenges associated with complex tasks when working virtually, they also argued that creating relationships, interacting informally, engaging in knowledge sharing and brainstorming ideas to foster creativity may not be possible in these teams. Resultant from this, researchers have advocated for further studies into understanding team interactions and other contextual factors that may exist when dealing with complex tasks in a virtual environment. This will allow the researcher to explore the

requirements and competencies that promote the achievement of team goals for better team outcomes when dealing with complex tasks.

Research Question 3: How does the sharing of leadership across team members support task complexity in a virtual project team?

D'Innocenzo et al. (2016) alluded to the fact that shared leadership is beneficial when solving complex tasks because it is unlikely that a single person will possess the knowledge and expertise required for these tasks. However, their study also identified that as tasks become more complex, shared leadership may be too difficult to manage, thus leading to contradictory outcomes. This results in the need for a further understanding into how shared leadership can support complex tasks in virtual project teams by discovering the behaviours that are associated with this leadership style that will support the tackling of complex tasks in virtual project teams successfully.

The next chapter elaborates on the research design and methodology that has been selected in order to address the questions posed above and explore the research problem.

4. Chapter 4: Research Methodology

4.1. Introduction

This chapter provides an overview of the research methodology used in this study. The selection and reasoning of the research design, including how data has been collected and analyzed in order to answer the research questions, is described.

4.2. Research Methodology and Design

While task complexity and shared leadership within virtual teams have been well researched, the concepts are still developing, with constructs and definitions still not yet widely agreed upon in various team types (Scott-Young et al., 2019; Liao, 2017).

Therefore, an exploratory qualitative approach was followed as it allowed for insights and knowledge to be gained into these concepts and constructs that was not yet fully understood through the posing of open-ended questions (Saunders & Lewis, 2018; Creswell, Hanson, Plano & Morales, 2007). Additionally, this approach was also well suited to this study, which was subjective, context dependent and socially constructed. Qualitative research techniques were also capable of handling complexities associated with the IPO framework of virtual teams (Figure 1) that had been formed from dynamic team process factors and emergent states (Saunders & Lewis, 2018; Dulebohn & Hoch, 2017). Furthermore, the qualitative data gathered aided in understanding why or why not emergent relationships held (Eisenhardt, 1989).

This study also adopted an interpretivist philosophy to theory building. This allowed for the discovery of context-specific factors through semi-structured interviews by interpreting and constructing meaning of the behavioural emotions, experiences and realities of the team members in virtual project teams from their point of view (Saunders & Lewis, 2018). In line with an interpretivist philosophy, an inductive, bottom-up approach to theory building was followed, allowing for a shift from specific observations discovered to broader theoretical perspectives (Braun & Clarke, 2006). This helped the researcher to discover new insights into how task complexity and shared leadership shaped the relationships and interactions between team members in virtual project teams. Furthermore, a mono method study was adopted, based on the research objectives that required a single data collection technique (Saunders & Lewis, 2018).

This study also followed a phenomenological approach. Quinney, Dwyer and Chapman (2016) maintain that research within a phenomenological framework was best suited towards understanding several individuals common or shared experiences in order to provide new insights and truths surrounding a particular phenomenon. Saunders and Lewis (2018) suggested that data for such research be collected mainly through in-depth interviews of participants. In addition to this, a cross-sectional study which captured an occurrence at a specific point in time was deemed the most appropriate choice for this research as it was time-bound.

4.3. Population

Saunders and Lewis (2018) described the population as the complete collection of subjects sharing common characteristics from which the sample is drawn in order to impart insights to the researcher and delineate the limits of the research findings. The population for this study was MBA syndicate groups as well as their team members. And their credibility towards this study is described below.

According to the Gordons Institute of Business Science (GIBS) (2020) and MBA (2020) websites, syndicate groups have been structured so that there is a balance of skills and backgrounds in a team and each team member is required to assist one another with the syndicate group projects. Syndicate groups also did not have formally appointed group leaders. Additionally, besides the Covid-19 pandemic and travel bans, there had been a shift towards virtual team arrangements (Zhu & Lee, 2017; Liao, 2017; Eisenberg et al., 2016; Dulebohn & Hoch, 2017), which led to syndicate groups having to work virtually to complete their projects. Moreover, the tasks performed by MBA students have been said to be complex in nature, with a further review of virtual teams' research over 15 years arguing that student project-based teams could be included as field studies as these teams complete "real", meaningful and often professional work as opposed to laboratory tasks (Carson et al., 2007; Gibbs et al., 2017).

In light of this, the population for this study was defined as MBA students from syndicate groups that worked on projects virtually, based on the credible insights they were able to provide towards achieving the research objectives of this study.

4.4. Unit of Analysis

Saunders and Lewis (2018) defined a unit of analysis as the major entity that is being analysed in a study and the entity about which the researcher wants to make a specific conclusion. The unit of analysis referred to the measurement source from whom the data would be collected (Zikmund et al., 2013) and this related to the perceptions, feelings and lived experiences of MBA students who had shared the experience of working in syndicate groups virtually. These perceptions, feelings and lived experiences formed the unit of analysis and were studied in order to gain the required exposure, knowledge and insights to enrich the dataset for the study.

4.5. Sampling Method and Size

A non-probability, heterogenous, purposive sampling method was adopted for this study. Purposive sampling was used for non-probability sampling wherein the researcher specified inclusion criteria against which the participants were selected (Saunders & Lewis, 2018). With a complete list of the population of MBA syndicate teams unavailable, selection from this population could not be random. The chosen sample also allowed for variation in the collected data where the syndicate group members consisted of sufficiently diverse characteristics through gender, ethnicity and profession which afforded different levels of knowledge, skillsets and abilities.

Inclusion criteria for the purposes of this study were syndicate groups that were currently pursuing their MBA, had worked together for at least six months and had a similar team size. The sample size was informed primarily by the research objective, questions and design, in addition to, Creswell and Poth (2016) recommending a sample size of 15 to 25 participants as the initial target but with data saturation dictating the termination of sampling. A GIBS MBA syndicate group generally consisted of 5 to 8 team members. Therefore, the researcher actively selected a sample size of 15 participants from 3 GIBS MBA syndicate groups based on the inclusion criteria. This sample size was deemed to provide adequate data saturation.

4.6. Measurement Instrument

Semi structured interviews were used as the measurement instrument in this study. Eisenhardt (1989) confirmed that interviews provided for a rich source of data. Semi-structured interviews were usually performed in qualitative studies and made use of an interview guide, which allowed the researcher to guide and manage the conversation by asking predetermined questions that were specific to the research

themes and questions asked (Saunders & Lewis, 2018). Interview protocols and tips provided by Jacob and Furgerson (2012) were used in formulating the interview guide. A script was also prepared to guide the interview process and share all important information relating to the interview. Well-chosen, open-ended, expansive questions guided by the literature review and the research questions were posed. A copy of the interview guide is provided in Appendix 1. A pilot study was also conducted to test the interview guide and refine it, which then resulted in 10 well written questions that formed the final interview guide. It would take approximately an hour per participant to get through these questions once ethical clearance was provided in order to proceed with data collection (Jacob and Furgerson, 2012). The electronic notes made assisted in providing insights in areas that would further enrich the dataset for the study.

4.7. Data-gathering Process

Research data was collected on approval of ethical clearance by the Research Ethics Committee which included submitting the research methodology, consent form, interview guide and a non-disclosure agreement for the transcriber and editor to maintain confidentiality. The ethical clearance approval letter is provided in Appendix 2. The consent form explained to the participant the purpose of the research, the approximate duration of the interview and that their participation was voluntary in addition to their consent of the interview being recorded together with the assurance that the information they share would remain confidential and anonymised.

Syndicate lists from two cohorts were obtained from the class representative. Thereafter, a personalised WhatsApp message was forwarded to nine selected members across different syndicate teams who were known to the researcher. The message contained a ‘participation request’ letter which detailed the reasons for the study along with a request to take part in the study and clarification that confidentiality and anonymity would be maintained. The member was also informed that consent from a minimum of five team members was required in order for the syndicate team to be selected and each interview would last approximately 45 to 60 minutes. This was followed by a phone call to answer any questions. The researcher received consent from four syndicate groups with 23 participants and in the end, participants were selected from 3 syndicate groups consisting of 5 participants each, totalling 15 participants.

Thereafter, a personalised email was sent to each of the 15 participants to thank them for their acceptance and invite them to take part in the interview at a proposed date and time of their convenience. On confirmation of the interview date and time, a Microsoft (MS) Teams calendar link was sent to the participant. This was followed by a final email 3 days prior to the interview which consisted of the consent form that needed to be signed prior to the interview along with a reminder of the interview date and time.

At the time of the interview, the researcher followed the format of the interview guide (as per Appendix 1) to thank the participants for their time and the signed consent form, explained the purpose of the research and introduce the main constructs in the study to ensure participants understood the background relating to the questions. The researcher reiterated to participants that their participation was voluntary and that the interview would be recorded, and they were encouraged to speak openly, with the information they share remaining confidential and anonymised. Participants were asked questions as per the interview guide and these questions were prepared in line with those posed in Chapter 3. The order of the questions did not vary for any of the interviews, however, further probing questions were asked so that the participants could provide more details where required to enrich the dataset for the study (Saunders & Lewis, 2018).

During the online interview process, internet mediated observation was observed through a video interview where a positive and non-threatening self-image of the interviewer was maintained while encouraging participants to offer responses based on their own perspectives (Saunders & Lewis, 2018). Brief electronic notes were taken during the interview process so that eye contact was maintained (Jacob and Furgerson, 2012). Once the interview was complete, the participants were thanked for their time and thereafter, the recorded interviews were converted to an audio format and transcribed for further analysis (Saunders & Lewis, 2018) using an external transcriber who was required to sign a non-disclosure agreement to maintain confidentiality. This transcript together with the audio file and consent form formed part of a full record and the researcher maintained all evidence in an electronic format.

4.8. Data Analysis Approach

A thematic analysis was performed to analyse the data collected by searching across the data set to identify, analyse and report repeated patterns (Braun & Clarke, 2006). In their research, Kiger and Varpio (2020) identified the six-step thematic analysis approach to be a useful and powerful method when seeking to understand a set of experiences, thoughts or behaviours through a wide data set to search for common or shared meaning. They further explained that this process has a "flexible and robust analysis method" to analyse complex phenomena such as those encountered in a virtual team's environment.

The first step involved the researcher familiarising themselves with the entire dataset through the repeated and active reading of all the transcripts. The transcripts from the transcriber were further checked for veracity by the researcher in order to ensure accuracy of meaning when compared with the original audio recording. Each transcript created from the participants words in the interview was loaded onto Atlas.ti (2020), a qualitative data analysis software (Saunders & Lewis, 2018). The second step performed was where words that appeared to capture key thoughts or concepts in a meaningful way regarding the phenomenon were used to derive codes. Labels for codes emerged that were reflective of more than one key thought and became the initial coding scheme. The third step included an analysis of the coded data to search for broader themes of potential significance. These were constructed by the researcher through analysing, combining and comparing how codes were related and linked to one another, through the use of pattern matching techniques. These initial themes were derived inductively by being closely associated with the original data yet reflective of the entire dataset. In the fourth step, the researcher re-examined these identified codes to ensure proper fit. This was an iterative process that continued until codes were common and coherent and additional refinements were not yielding substantial changes, resulting in coding saturation being achieved. An extract of the code book is provided in Appendix 3.

The fifth step involved defining and naming themes which led to a coherent narrative of how and why the coded data within each theme provided the insights required to understand the research questions posed. Finally, the last step involved the write up of the final analysis and presentation of the final themes which provided a clear understanding of how the researcher interpreted the data and why the derived

themes were important and accurate to richly and fully answer the research questions posed (Braun & Clarke, 2006; Kiger and Varpio, 2020).

4.9. Quality Controls

According to Morse, Barret, Mayan, Olson & Spiers (2002), quality assessment criteria used in order to perform a trustworthy qualitative study were credibility, transferability and confirmability. In addition to this, their research also addressed reliability and validity as key concepts for achieving rigor in qualitative research. Reliability referred to the idea of data adequacy while validity referred to data appropriateness (Spiers. Morse, Olson, Maria, Mayan & Barret, 2018).

In order to improve the likelihood of credibility, transferability, confirmability and reliability of the research as well as the findings, the following actions were implemented:

- To ensure transferability, a purposive sample contained participants that had the necessary experience to provide insights required towards answering the research questions posed. Furthermore, both Carson et al., (2007) and Gibbs et al., (2017) argued that student project-based teams could be concluded as field studies, allowing this research to be related to other contexts as well (O'Reilly & Kiyimba, 2015).
- An ethical clearance process was followed, and ethical clearance approval was obtained for the study (see Appendix 2). This contributed to the respondents' keenness to express their lived experiences, thereby improving validity through ethicality (O'Reilly & Kiyimba, 2015). The participants provided their full consent for the interview, where confidentiality and anonymity were maintained during reporting.
- Respondents were selected for diversity in terms gender, ethnicity and profession.
- The researcher used the semi-structured interviews with the interview guide derived from the literature review to improve the likelihood of accurate and reliable theory (Eisenhardt, 1989). Furthermore, open ended, expansive questions were posed, encouraging the respondents to contextualise their responses (Flick, 2018). Interviews were also reflective and iterative, with additional probing notes added after each interview.

- A pilot study was conducted to test the measurement instrument with the aim to refine it where necessary and also to improve its reliability (Morse et al, 2002).
- The presence of interview bias, interpreter bias and response bias were well noted by the researcher during the interview and data analysis process. (Saunders & Lewis, 2018). As a result of this, the research conducted attempted to achieve validity and reliability and ensure rigor through prolonged engagement and persistent observation with participants during video interviews with the average interview length being between 45 to 60 minutes per interview.
- All interviews were fully transcribed and stored electronically. The transcripts were compared to the recordings again by the researcher for accuracy, thus increasing reliability (Flick, 2018).
- The coding process was inductive through the use of open codes from which categories were derived and thereafter themes that related to each research question. Furthermore, the results were discussed through a spread of quotations from various participants to ensure confirmability and transparency (Jensen, 2012; Rheinhardt, Kreiner, Gioia, & Corley, 2018).
- Data triangulation across participants and through cross team analysis helped to corroborate and enrich findings as well as increase the validity and confirmability of the analysis.
- While some participants believed that an academic environment differed to a work environment, teams in both environments are put together for a common purpose, resulting in similar experiences as described under Section 4.3. where both Carson et al., (2007) and Gibbs et al., (2017) argued that student project-based teams can be concluded as field studies. Furthermore, the researcher linked observations from this study to the variety of existing literature available from other contexts, as identified in the literature review. This also raised readers' confidence of the valid phenomenon being observed with a small sample size of 15 participants while also strengthening generalisability and ultimately, transferability to other project teams (Gersick, 1988).
- An audit trail of the data construction, data-gathering and analysis process provided a clear record of the coding process and Excel was used to portray

the saturation results. This ensured further confirmability and dependability (Jensen, 2012; Seale 2012).

- An extensive explanation of the data-gathering and analysis process was provided to ensure credibility of the process (Rheinhardt et al., 2018).

4.10. Limitations

Given the nature of qualitative research, limitations of reliability and validity were identified as a result of potential researcher bias which may have influenced the literature review, interview process, analysis, findings and conclusions (Yin, 2003). However, the advantage was that the researcher possessed similar experience they were also part of a syndicate team in the same environment and therefore could prevent this bias to some extent. The selected small, purposive sample was also not representative of the entire population and could not be generalised as such (Saunders & Lewis, 2018). While syndicate groups worked in virtual project teams for academic purposes, different results could be observed for virtual project teams who worked in different organisational settings on a full-time or consultancy basis. Furthermore, the cross-sectional nature of this study limited the scope of the researcher's ability to measure changes over time, particularly in the context of the dynamic and emergent state processes that were present in virtual teams.

4.11. Conclusion

This cross-sectional study followed an exploratory, mono method, phenomenological qualitative approach and adopted an interpretivist philosophy of an inductive, bottom-up approach to theory building. A non-probability, heterogenous, purposive sampling method was adopted for the study and semi-structured interviews were used as the measurement instrument in the study to provide a rich source of data from participants across MBA syndicate groups. During the data-collection process, internet mediated observation was followed to gain the most precise responses. This was in addition to other quality control criteria that was followed to ensure a trustworthy study was performed. Thereafter, a thematic analysis was performed to analyse the data collected and these results are presented in Chapter 5, taking into consideration the employed quality controls.

5. Chapter 5: Results

5.1. Introduction

This chapter presents the results as per the conducted interviews and in line with the research questions listed in Chapter 3. The findings are presented in themes as they relate to the research questions (Braun & Clarke, 2012). First, a description of the participants is presented in order to depict the credibility of participants targeted and assess the knowledge they possessed to enable them to respond to the research questions. Thereafter, the data preparation process is discussed followed by insights into the identified themes and findings thereof as part of the thematic analysis process.

5.2. Description of the Sample

As discussed in Chapter 4, a non-probability purposive sampling was used in this study, wherein the researcher specified inclusion criteria against which the participants were selected (Saunders & Lewis, 2018). Twenty-three participants from 4 MBA syndicate groups were approached and in the end 15 interviews were conducted with participants from 3 MBA syndicate groups where team members worked virtually to complete complex projects. The recommended sample size of 15-24 participants, as suggested in Chapter 4, was fulfilled. The syndicate groups provided for sample diversity through gender, ethnicity and profession which afforded different levels of knowledge, skillsets and abilities.

Table 1: Summary of Participants

Participant	Gender	Profession
D1	Female	Lawyer
D2	Male	Engineer
D3	Male	Strategist
D4	Male	Engineer
D5	Male	Physiotherapist
D6	Male	Product Strategist
D7	Male	Product Manager
D8	Female	Business Consultant
D9	Male	Operations Manager
D10	Male	Wealth Management Professional
D11	Female	Business Owner
D12	Male	Operations Director
D13	Male	Operations Manager
D14	Female	Human Resources Manager

Participant	Gender	Profession
D15	Male	Engineer

5.3. Data preparation and analysis process

As described in Chapter 4, the researcher used the semi-structured interview guide, as shown in Appendix 1, where the order of the questions did not vary for any of the interviews, however, further probing questions were asked where more details were required. The interview guide had specific questions that were intentionally aligned with the research questions and posed in the interviews in order to ensure that the research questions were adequately responded to. A pilot study was conducted to test the interview guide and the interview guide was refined as necessary. The interviews were conducted virtually using video mode on MS Teams and recorded both on MS Teams and on an audio recording device. During the video call, the researcher used internet mediated observation to converse the with participants in a relaxed and friendly manner in order to encourage responses based on their own perspectives and limit potential interview bias (Saunders & Lewis, 2018). The researcher was able to clarify any points raised by the participants and probing notes were taken for future interviews. Tonal variations were limited, and non-verbal behaviour was avoided to limit interviewer bias (Saunders & Lewis, 2018). Once the interview was complete, the participants were thanked for their time and thereafter, the recorded interviews were saved as an audio format and transcribed for further analysis (Saunders & Lewis, 2018) using an external transcriber. All recordings, transcripts and consent forms were electronically saved.

Table 2 provides details relating to the interviews. A total of 150 pages of transcripts were generated with the average length of an interview being approximately 57 minutes. The interviews were conducted over a 23-day period at a time that was convenient to each participant to retain participants' confidentiality and anonymity, avoid any interruptions and gain the full attention of the participant, consequently limiting response bias.

Table 2: Summary of Interview lengths and durations

No of Participants	Total Pages of Transcript	Average Interview Length
15	150	00:57:22

Source: Author

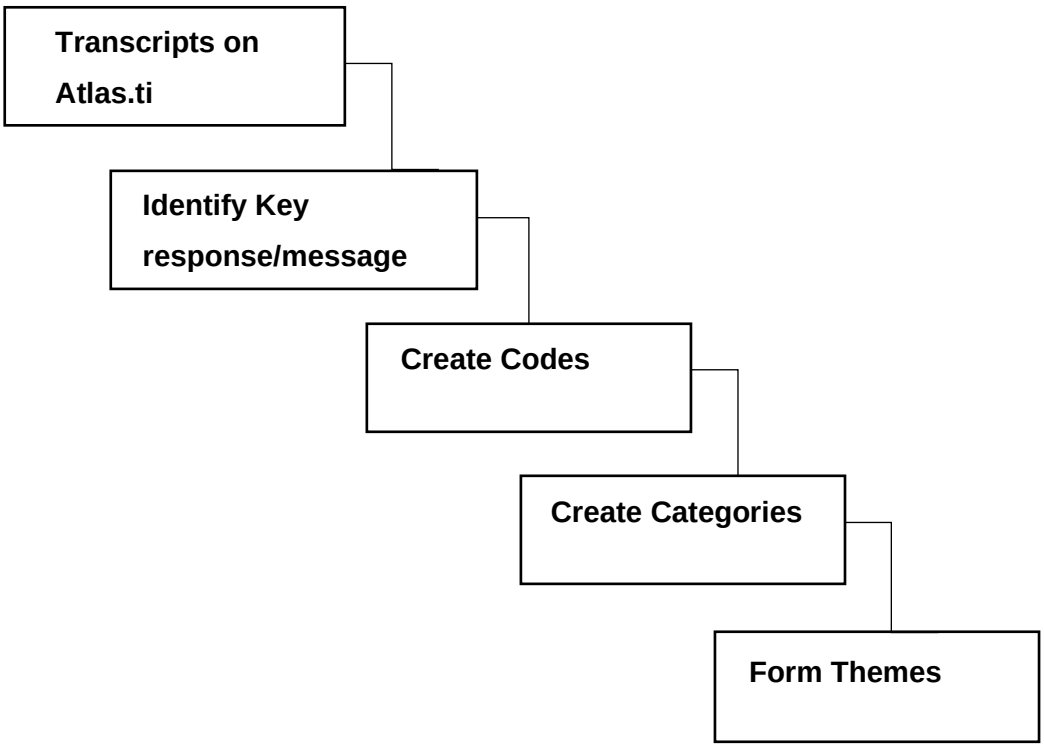
In an effort to ensure credibility of the data preparation as well as following the thematic process, the audio recordings of the 15 interviews conducted were transcribed by a professional transcriber, using a manual process of listening to the interview recordings and writing the transcripts. The transcripts were checked and read by the researcher for veracity in order to ensure meaning was clear when compared with the original audio recording in order to reduce interpreter bias and also to gain familiarity with the dataset. Each transcript created from the participants words in the interview was loaded onto Atlas.ti, a qualitative data analysis software (Saunders & Lewis, 2018), to guide the analysis process.

A thematic analysis was performed where initial open codes were generated both for each of the interviews using the participants words taken at face value. After coding, the quotations (participants' words) under each code were reviewed to ensure that the right quotations were assigned to each code. This involved unlinking some codes from quotations and recoding. Thereafter, a prefix was added to the codes based on how the different codes were related and linked. This involved merging, splitting and deleting some of the codes. This process of adding a prefix to the code aided the creation of 20 meaningful categories (known as code groups in Atlas.ti) that had potential significance to the research questions.

Following this, an Excel report was extracted from Atlas.ti and this contained the complete list of codes and categories (also known as the code book) which were then sorted according to commonality. A copy of the Excel code book is provided in Appendix 3. A further analysis of this Excel report based on commonality and coherence led to the formation of themes which provided the insights that were required to understand the 3 research questions posed. Common and coherent codes were selected and grouped into three colours according to the research question posed. Interesting and new insights were also included in the grouping, and these could potentially be fielded for future research.

Data triangulation across the participants, through cross team analysis, and through literature review examination helped to corroborate and enrich findings in order to increase the validity of the analysis (Yin, 2003). The final step involved the write up of the analysis and presentation of the themes which provided clarity on the derived themes and their importance and accuracy to richly and fully answer the research questions posed in Chapter 3. This process is illustrated in Figure 2 below.

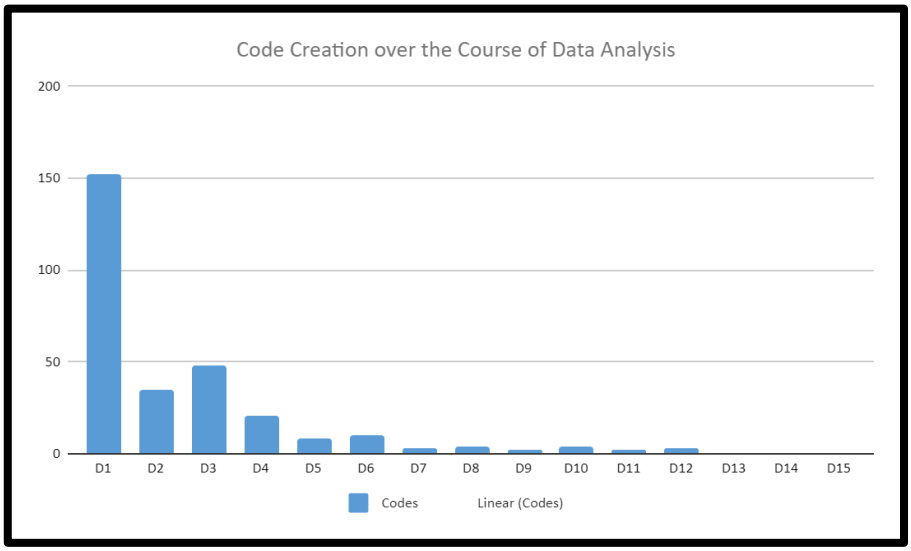
Figure 2: Data preparation process



Source: Author

A total of 291 codes were created in the initial coding process. After the codes were reviewed, 20 categories were formed. These categories represented 16 themes that were characterised by the 3 research questions set out in Chapter 3. This formed the code book as shown in Appendix 3. Figure 3 below demonstrates the saturation point for code creation which was achieved at Participant D12 where no new unique codes were found through the data gathering and analysis process.

Figure 3: Saturation graph



Source: Author

5.4. Data Validation

The data validation checklist provided in Table 3 consists of the quality control criterion, the recommended principle associated with this criterion and how it was used in this research to ensure data validation.

Table 3: Data validation checklist

Quality Control criterion	**Recommended principle**	**How it was used in the research**
Data construction: Selection	Advised (Flick, 2018) 1. Selection sample with diversity of respondent base 2. Encouraging use of broad, open-ended questions; seeking within interview clarification; encouraging respondents to contextualise their responses 3. Allowing respondents to take the lead 4. Between interview reflection	Respondents were selected for diversity in terms of gender, ethnicity and profession Open-ended, expansive questions were posed to gain insights from participants based on their perspectives. Probing questions were also asked

Quality Control criterion	**Recommended principle**	**How it was used in the research**
	5. Pilot study to test measurement instrument (Morse et al, 2002)	where more information was required. Interviews done on an iterative and reflective basis. A pilot study was conducted to test the measurement instrument and refine it and improve its reliability
Data transcription	Full transcription supplemented with note-taking (Flick, 2018)	All interviews were fully transcribed by an external transcriber and stored electronically. The transcripts were also compared to the recordings again by the researcher for correctness and to improve credibility of data.
Credibility	What is needed (Rheinhardt et al., 2018): 1. Sufficient detail for the audience to ascertain plausibility 2. Enough information describing data-gathering and analysis procedures 3. A review of the types of data used by the researcher	Extensive detail provided on the data construction, collection and analysis process All raw and processed data has been documented. Prolonged engagement and persistent observation with participants during

Quality Control criterion	**Recommended principle**	**How it was used in the research**
	4. Interviewer bias, interpreter bias and response bias should be consistently noted and minimised during the interview and data analysis process (Saunders and Lewis, 2018)	interviews with the average interview length being approximately 60 minutes
Transparency	What is needed (Rheinhardt et al., 2018): 1. Research endeavours to remain true to the informant by accurately capturing all that is relevant of the informant's descriptions 2. Explication of how theory was used; that is, the degree to which the process was inductive (open coding), deductive or abductive	Results relied on a spread of direct quotations. The coding process was inductive, using open-ended coding. Extensive review of the coding process was provided.
Dependability	In place of consistency, or reliability, conceived by Lincoln and Guba is "dependability', achieved by "auditing" (Seale, 2012). An audit trail should be kept by the researcher which documents the data, methods and decisions made (Seale, 2012)	All parts of the data gathering methods were recorded, as was the categorisation. The use of Atlas.ti provided a clear record of coding process and Excel was used to portray the saturation results.

Quality Control criterion	**Recommended principle**	**How it was used in the research**
Confirmability	To be used to replace the convention of neutrality or objectivity (Jensen, 2012) 1. Presence of an audit trail 2. Exercises in reflexivity, which is the methodologically self-critical account of the research process 3. Could also involve triangulation 4. Demonstration that the data is grounded in the participant's lifeworld	An audit trail was kept. Open coding and the use of quotations in reporting ensured that the participants' lived experiences were captured. Data triangulation through cross team analysis helped to corroborate findings and increase confirmability.
Ethicality	Important for the worthiness and contribution (O'Reilly & Kiyimba, 2015) 1. A risk and benefit assessment 2. Significance of contribution 3. Worthiness of topic	Ethical clearance was obtained for the study (See Appendix 1) The respondents were keen to express their lived experiences. The participants provided their full consent for the interview where confidentiality and anonymity were maintained during reporting.
Transferability	In place of transferability: (O'Reilly & Kiyimba, 2015, p. 40) "the degree that the research can be related to other contexts."	A purposive sample allowed for the sample to contain participants that had the necessary experience to provide insights required

Quality Control criterion	Recommended principle	How it was used in the research
	Reader confidence of the valid phenomenon being observed when compared to literature from other contexts raised generalisability (Gersick, 1988)	towards answering the research questions posed. Some participants believed that an academic environment differed to a work environment. However, teams in both environments are put together for a common purpose, resulting in similar experiences as described under Section 4.3 where both Carson et al., (2007) and Gibbs et al., (2017) argued that student project-based teams can be concluded as field studies. Observations from this study were found to link to existing literature available from other contexts as identified in the literature review.

Source: Adapted from Chipp (2021)

5.5. Findings in Relation to Research Questions

5.5.1. Research Question 1: How does technology play a role in the development of virtual project teams?

The aim of this question was to establish the role of technology in the development of virtual project teams. It was important to establish that participants understood that

technology plays a role within virtual project teams. It was also important to understand what this role was, as evidenced by participants lived experiences, and as well as the advantages and disadvantages thereof.

Themes that emerged included collaboration, communication, flexibility and establishing networks. These themes are discussed below.

5.5.1.1. Collaboration

Participants explained that indeed technology did play a role in the development of virtual teams. Some pointed out the role technology plays in terms of enabling collaboration. The specific codes that led to this theme are discussed below.

i. Work in isolation

Participants explained that technology enabled better collaboration, wherein the team could come together on the digital platform to discuss and agree on the objectives of the tasks at hand, share responsibilities, go away individually or in smaller groups to work on assigned tasks, then come together as a group to put the main task together.

Participant D10 confirmed this by saying:

> "So, we would touch base and everyone would go and work on their different pieces of work, and then we would email drafts around to each other."

Participant D2 echoed Participant D10's sentiments and added that the use of cloud solutions allowed for easier collaboration where team members could add their portions of work in their own time or together as a team.

> "I think what helped us was having Google Drive where we shared documents, where we could actually update in our own time or update together as a team. So that helped a lot as well."

ii. Link people and processes

Participants pointed out that technology also enabled collaboration by linking team members and processes. Participant D1 gave an example where team members could work on the same document at the same time, without overriding each other's work while also being able to see each other's thought process and progress on work done. This then allowed team members to collaborate efficiently.

> “It was so nice to be able to work on the same document together and see where people make changes. You also get to see where their thoughts are, so it was very nice to collaborate on a single document at the same time. So, you could track progress and see what’s happening.”

iii. Consolidating information

Some participants explained that one of the advantages of technology in virtual teams was its ability to enable better collaboration through effective gathering and consolidation of information.

Participant D1’s remarks were:

> “In terms of gathering the information and putting it together, great.”

iv. Multiple ICT platforms

Participants loved the idea that the team could collaborate easily across multiple platforms enabled by technology. This meant that work could continue, regardless of which platform was used. Also, the platforms used were complementary to each other and allowed for seamless collaboration.

Participant D3 articulated this by saying:

> “[Technology] also allowed for collaboration in a sense that then if the information can be shared across those platforms or those channels, then people can also then collaborate on papers also virtually using the communication between the platform; virtual platform like MS teams and Zoom, but also collaboration working on a task across Google files.”

Participant D1 also added to Participant D3’s sentiments that the multiple platforms allowed for better collaboration:

> “We used multiple platforms, we used WhatsApp to reinforce and remind, or ask questions. We recorded meetings for those who couldn’t attend or had load-shedding.”

v. Tracking progress

Participant D1 elaborated that technology allowed for team members to easily track their own as well as each other’s progress on projects. This was made easier by technology that allowed team members to work on the same document at the same time, without overriding each other’s work.

> “It was so nice to be able to work on the same document together and see where people make changes. You also get to see where their thoughts are, so it was very nice to collaborate on a single document at the same time. So, you could track progress and see what’s happening.”

Participant D5 echoed Participant D1 and added that:

> “So, by being able to constantly ... work on something at the same time as someone else, from the comfort of your own space. It definitely helped for there to be a lot more symmetry and alignment of our assignment. It made it a lot easier to get the same message throughout the whole ... you know, the whole project.”

5.5.1.2. Communication

Communication came out as one of the strong themes among virtual project team members. The ability to share information and have seamless discussions in a virtual environment was deemed important as enabled by technology. Participants highlighted both advantages and disadvantages of communication through technological platforms. Codes that came out strong within this theme are discussed below.

i. Increased frequency of communication

Some participants explained that technology allowed for frequent communication through the various platforms. Unlike in the past, where teams relied only on email or telephonic communication within working hours, virtual team members had the advantage of being able to almost communicate with each other at any time.

Participant D11 explained that:

> “Two things – making use of WhatsApp, so there was no one who doesn’t have a phone on them 24/7, whereas you might not always be checking your emails. And using WhatsApp effectively…”

ii. Reducing barriers to communication

Participant D3 elaborated on how technology enabled better collaboration by reducing barriers to communication. His sentiment was that the formal face-to-face communication method can be a barrier. However, with the use of technology communication platforms and tools, it was easier to communicate as there were no barriers such as facial expression, tone, etc. He explained that:

> “The other platforms like WhatsApp permits for people to communicate on an ad hoc basis and sending information across. And that basically then reduces the communication barrier in terms of formality because the formal way of communication can be communication barrier in itself.”

iii. Lowers cost of communication

Participants commented on how technology also made collaboration easier by reducing the cost of communication. This is because team members across geographically dispersed locations could use technology, which in some cases was cheaper, to communicate and to work on their projects. Reduced data costs have also made connectivity among team members, through various platforms, much easier.

Participant D4 elaborated this by saying:

> “But the fact that communication is so cheap, it is so available, and is there at any point, just made connectivity work out so easy and so well.”

iv. Frustrates discussion flow

While most participants agreed that technology enabled communication, some participants pointed out that technology did become a hindrance to communication in some cases. This was true for cases where there were incompatibility issues with software and hardware between team members. This was encapsulated by Participant D5 when he said:

> “…there were challenges ... getting the technologies to work the same and everyone wants to…”

On the other hand, ‘digital etiquette’ and skills played a role in disturbing the communication flow among team members. In some cases, where team members were not eloquent with digital skills such as knowing how to mute mics, raise hands or use comments functionality, chaos emerged as team members talked over each other while some could not communicate at all.

Participant D11 articulated this by saying:

> “In the meetings where everyone has got their mic open and just talking it is obviously not going to work, and in the meetings where everyone is waiting to put their hands up to say something it’s also not good flow, there are not good discussions happening and it takes so long for the chairperson to say

> ‘Okay, you can have your turn’ and then the point is already missed and you have moved on.”

v. Disrupts communication

Poor infrastructure came out as one of the things that hindered the flow of communication. Participants pointed out that in some cases, team members were unable to connect to digital collaboration platforms because of issues such as load-shedding and bad or lack of network signal.

Participant D5 commented that:

> “So, like I said earlier. I mentioned one of our members - he struggles often with connectivity. So, in general, he is a quieter person [laughs]. So, I definitely think it impacted his contribution sometimes.”

Participant D15 had poor infrastructure and added that:

> “So, I live in Soweto, so I have and continue to experience a lot of network issues, so what I have to do is drive to the nearest cell tower to get a decent signal.”

5.5.1.3. Digital Divide

Some participants pointed out that while technology enabled collaboration within virtual project teams, it also exposed the realities of the existing gaps between those who have access to modern technology and those who do not. Infrastructure issues such as lack of electricity, lack of network infrastructure in some geographical areas were some of the challenges. Predominant codes within this theme are discussed below.

i. Power disruptions affect connectivity

Participant D10 explained that load-shedding and the ability to connect were some of the challenges:

> “Some people would have issues with load-shedding, or internet outages, or not being able to hear, or portal activity. So those were some of the challenges we had to deal with.”

ii. Bandwidth inconsistencies

While some participants had adequate and modern technological infrastructure, others had poor infrastructure, and this negatively affected collaboration and created

friction at times between team members. Evidence of good infrastructure was mentioned by Participant D7 when he said:

> “So, I've always had an uncapped high speed fibre line in my home. But what frustrated me a lot was other people, that I depended on, did not necessarily value those same things. And understandably so. But it would impact on: "sorry my line is dropping" or "sorry there is load shedding" or "sorry I don't have ... you know I have to switch my camera off because I keep disconnecting because my network is very slow". So, to sum it up again, I would say my biggest challenges when working with other people in this online virtual platform would be data latency.”

In contrast to Participant D7, Participant D15 had poor infrastructure and commented:

> “So, I live in Soweto, so I have and continue to experience a lot of network issues, so what I have to do is drive to the nearest cell tower to get a decent signal. If I connect to a virtual meeting like the one we are having now from home, I get cut off a lot, and that is not very nice. And naturally some people won’t understand that, but then again, I can’t blame them because you know not all of us know the struggles of township life. So, you can’t hold that against people.”

iii. Different competency levels

Participants explained that there were certain skills that were necessary for one to collaborate better within virtual project teams. These included such things as knowing how to set up virtual meetings, how to share screens, how to mute mic as well as how to switch the camera on and off. With the teams, members were at different competency levels.

On the issue relating to technical skills, Participant D12 commented that:

> “Having said that, in my previous syndicate we did have someone in particular who was a bit older should I say, and they really were not that skilled in terms of basic computer skills. So, whenever they had to share or took the lead then that was a bit of a detriment for them and the team as well, because it was difficult for us to teach that person how to do things when we were also not with them in the room.”

Participants also added that in some cases technology helped to bridge the digital divide. This was true for circumstances where various technological platforms were used to keep all team members on the same page.

Participant D1 stated that:

> "So, we all just kept posting all our stuff on the platforms… We recorded meetings for those who couldn't attend or had load-shedding. For those who had scheduling conflicts and then we recorded it, we uploaded it. If they can't attend a meeting in person, because there were interviews where we could go in person, and those who couldn't join, we allowed them to join virtually."

Participant D2 added that:

> "We would share the next steps on our WhatsApp group or on Google Drive, depending what platform we would have been using, and then each person was responsible for actually delivering on that."

5.5.1.4. Flexibility

Participants commented that technology enabled for flexibility within virtual project teams. This flexibility ranged from tools to use, moving times around to accommodate other team members as well as making use of recordings to align team members. Below are the prevalent codes from this theme. These included flexibility for meeting times, platform usage as well as communication tools.

i. Flexibility for attendees

Participants mentioned that technology allowed them to be flexible in terms of arranging their project meetings.

Participant D8 commented that:

> "We had to find times that suits almost everybody so that we get the best out of everyone."

Participant D5 added that:

> "I think definitely flexibility ... peoples flexibility. And that comes back to that supportive sort of environment. We tried to be flexible and work around what people had to do. We tried ... That was one of the things"

ii. Flexibility in formats

Participants also noted that technology allowed them flexibility in terms of which formats and tools to use. This enabled for better collaboration where team members were not constrained by having to use only certain tools.

Participant D3 pointed out that:

> "I think being able to be flexible around technology helped where in other instances where we would ordinarily use MS Teams for meetings but then, it is not working out on that day, then we have to find an alternative, right. So, we decide okay so, let us use Zoom today even though we already have an appointment set on MS Teams"

iii. Flexibility for formal and informal interaction

Technology also helped participants to be flexible in terms formal and informal interactions. Most participants used a platform such as WhatsApp for more informal interactions while MS Teams and/or Zoom were used for more formal interactions.

Participant D1 elaborated that:

> "We used multiple platforms, we used WhatsApp to reinforce and remind, or ask questions. We recorded meetings for those who couldn't attend or had load-shedding."

5.5.1.5. Lack of Human Interaction

One of the themes that came out from the participants was that of lack of human interaction. Some participants pointed out that while technology enabled better collaboration, communication and allowed for flexibility within virtual project teams, it also took away the physical human interaction. Some participants deemed this interaction as important and necessary. Specific codes that emerged from this theme are discussed below.

i. Human interactions

Participant D7 pointed out that in virtual project team settings, where the interaction was virtual, the human connections and building bonds were not as strong as compared to face-to-face interactions. He articulated this by saying:

> "But in terms of the interaction, team building and the relationship elements; I do believe those parts of the shared value team leadership voice were not as strong as when we had the face-to-face interaction."

ii. Physical connectivity

Some participants felt that the virtual environment was unreal and superficial. This was because members came together only for the task at hand and then dispersed without forming any real connections. This was captured in Participant D2's comments when he said:

> "For lack of a better word, a superficial type of platform; it is not considered real from everyone's perspective. So, you couldn't really engage interpersonally and get a feel for the body language and those type of things."

iii. Visual connectivity

Some participants felt that the use of video for meetings in virtual project teams contributed to loss of intimacy among team members. This was true where, some participants felt that, when video was off, members on the other side could easily disengage and not participate in the discussion.

Participant D10 summed this concern as follows:

> "People find "it is easier to hide" and be a non-participant when you are meeting virtually. Because once the video is off and once the person is on mute the person might as well not be in that meeting."

5.5.2. Conclusion to Research Question 1

Table 4 below summarises the codes that form the themes discussed in this section relating to Research Question 1.

Table 4: Summary of themes and codes for Research Question 1

Themes	Codes
5.5.1.1 Collaboration	i. Work in isolation
	ii. Link people and processes
	iii. Consolidating information
	iv. Multiple ICT platforms
	v. Tracking progress
5.5.1.2 Communication	vi. Increased frequency of communication
	vii. Reducing barriers to communication
	viii. Lowers cost of communication
	ix. Frustrates discussion flow
	x. Disrupts communication
5.5.1.3 Digital Divide	xi. Power disruptions affect connectivity
	xii. Bandwidth Inconsistencies
	xiii. Different competency levels
	xiv. Flexibility for attendees

Themes	Codes
5.5.1.4 Flexibility	xv. Flexibility in formats
	xvi. Flexibility for formal and informal interaction
5.5.1.5 Lack of Human Interaction	xvii. Human interactions
	xviii. Physical connectivity
	xix. Visual connectivity

Source: Author

Participants pointed out that in terms of their lived experiences, technology did play a positive role in the development of virtual project teams. This included improved collaboration and communication, flexibility and closing the digital divide gap. On the other hand, technology also had a negative impact on virtual project teams. This included lack of proper infrastructure which hampered communication and collaboration as well as lack of physical interaction which some participants deemed important.

5.5.3. Research Question 2: How does task complexity affect working in a virtual project team?

The aim of this question was to establish how complex tasks were handled within virtual project teams. Participants agreed that task complexity affected working in virtual project teams. They also pointed out that the feeling that one is in a safe environment among team members allowed for better collaboration on complex tasks as team members could converse freely and openly about their opinions and shortcomings. Themes that came out strongly included psychological safety, knowledge sharing, confirmation bias as well as handling conflict. These are discussed in detail below.

5.5.3.1. Psychological Safety

Psychological safety was a dominant theme in relation to Research Question 2. Participants pointed out the importance of treating each other with respect and creating an environment where team members could speak freely and without fear of being judged.

i. Feel safe environment

Participants felt that it was important to create an environment where members were free to express themselves and contribute to the project, without fear of being judged. This was articulated by Participant D13 by saying:

> “So, there was a lot of openness there, and thirdly, I would say that it also brought out a place of comfort for the group members because there was no feeling of saying ‘if I raised this and I am not right, what are they going to say?’ It was always ‘you are in a safe space and we can robustly engage with a topic without having to be at each other’s throats”.

Participant D11 added that:

> “There is skill in figuring out the balance between open conversation and respectfully letting everybody have a turn to speak.”

ii. One-on-one intimacy

Some participants pointed out the importance of one-on-one intimate relationships among team members beyond work. They explained that when dealing with complex tasks, they would often break away into smaller groups, and this allowed them to form deeper bonds with some team members.

Participant D8 explained this by saying:

> “Because we go now beyond just academic space, where we get to know the person, what they do in terms of career, in terms of aspirations, what they keep themselves busy with.”

iii. Empathy towards participant preferences

Participants recognised that they were all not on the same proficiency levels in terms of using technology. Additionally, they had different preferences in terms of the technological tools that they used. This allowed them to recognise the need to be empathetic with one another to avoid the use of technology to get in the way of handling the tasks at hand. Participant D3 succinctly put it as follows:

> “So, the other skill is around empathy you know; being about to understand that we are not all on the same level in terms of comfort in using the technology.”

5.5.3.2. Knowledge Sharing

Sharing of knowledge also came out as one of the strong themes. Participants pointed out the necessity and importance of sharing knowledge and information with each other along with the importance of creating an environment where knowledge-sharing is encouraged with the aim of reaching a common goal. The participants used different technological tools to share their knowledge with others based on their

areas of expertise. Knowledge-sharing also extended to experts outside the virtual team as and when required.

i. Expert networks

Creating bridges to access expert advice emerged as a code. Some participants used their personal networks to provide expertise to the team which may not have been there. This was done in a collaborative manner where consensus was reached.

Participant D5 pointed to an instance where they went outside the team to seek expert advice:

> "One of the group members went out and spoke to their own personal financial advisor ... their financial banker and got information."

Participant D3 echoed and added the importance of relying on team members' strengths.

> "So, the main way of sharing knowledge; it was largely transactional task based and because then we all had to put in our part to make sure that we deliver on a particular task, and therefore each person with their skill sets would come in and deliver on that part for their part on the project."

ii. Share specialist knowledge

Participants elaborated on how knowledge experts went the extra mile to share insights relating to their area of expertise in advance in an attempt to gain buy-in.

In particular, Participant D4 pointed out that:

> "So, they even went that extra mile to use their insights to get information through research disseminated through digital platform, through digital media, and digital systems that we have, to share that knowledge. And include everybody."

5.5.3.3. Confirmation Bias

Task complexity involved a cross-functional team of experts. A reoccurring perception of experts having confirmation bias was established in the research. Some participants exhibited the need to come across as 'always correct'. Specific quotes relating to this are discussed below.

i. Full ownership in area of expertise

Participants explained that when it came to complex tasks, those who were most comfortable with the subject matter were given freedom to lead but also to take ownership and responsibility on leading the team to deliver.

Participant D13 summed this up by saying:

> "Ja, so really it came to us understanding each other as a grouping and whose strength led where, right? So, you would realise that on this particular task this one colleague is strong in X, and this other one is strong in Y"

Participant D14 also added that:

> "In terms of task complexity, if something was difficult, we always used to look at strengths amongst ourselves… then the expert would have a bit more time around that, by sharing whatever they know and how we can incorporate that into our assignment."

ii. Individual biases

Participants pointed out that sometimes it became difficult to moderate individual biases. This was true especially in cases where team members regarded themselves as subject matter experts on a topic or if team members were always the first to raise their opinion. In some of these instances, team performance declined, or the team was side-tracked from tackling the real task at hand as more time was spent on discussions.

Participant D11 summed up this experience by saying:

> "…where there were issues or frustrations or things didn't work out is, I think, mostly where someone actually had a confirmation bias towards their own expertise."

Participant D8 added that:

> "We have got this assumption that if you speak first you sound like you know what you are talking about."

iii. Competently skilled in area of specialisation

There was an expectation from the participants that members with specific expertise would be competently skilled in those areas to perform tasks relating to those areas. For example, if a team member was an accountant, there was an expectation that

they needed to know everything that has to do with finance. This was encapsulated in Participant D1 when she said:

> "…because it is knowledge workers, what you rely on is you are appointing the person for their expertise. So, the mine manager needs to talk to me about mining — is it viable, what is right, what is wrong?"

This was echoed by Participant D6 when he added that:

> "So, surprisingly enough, people tend to think that if you work for a financial services organization, you know every single aspect of finance in your organization."

iv. Inherent biases

Participants were aware that there were instances where the team was tempted to be derailed by inherent team bias. Because the team works well together and achieves the objectives well together, it was easier for the team to believe they were always on the right track. To prevent this mistake, Participant D11 advised that:

> "So, I think it is better to actually have no experts and no confirmation bias of expertise in the group, and rather be open to learning from each other."

5.5.3.4. Conflict

When working on tasks in a cross-functional virtual team, there were instances where clashes of personalities emanated. Some participants believed that one of the biggest causes of conflicts in a cross-functional team is the differences in work ethic across team members and/or motivation levels. Specific codes that emerged under this theme are discussed below.

i. Different effort levels

Participants mentioned that sometimes having different expectations in terms of the required effort needed to perform a task had caused problems. For this reason, it was important for team members to agree upfront on what the required deliverables were. Participant D13 succinctly put it that:

> "And that can be a source of frustration between task members where a task is being delivered but the other party thinks it is done, and then the other part thinks well, maybe it is not done to a particular level."

ii. Conflict

One of the challenges within virtual project teams was dealing with conflict. Participants pointed out that because the meetings were virtual, sometimes it was difficult to read body language to ascertain how to respond in a conflict situation. This came out from Participant D1 when she commented that:

> "…that makes it also difficult on a virtual platform because when we fight people and there is no one leader that is chairing the interaction it makes it difficult to interrupt someone, or to disagree with someone or to voice your opinion…"

Some participants had terms agreed upfront on how to deal with conflict, such as articulated by Participant D4 that:

> "So, we had articulated that in the team charter to say in a project, a project team would listen to everybody's opinion and if disagreements still persist the leader had the prerogative to go with any opinion that they believed is probably the right way so as to break the standoff."

iii. Conflicting personalities

Participants explained that in some cases, there were personality clashes as is often the case in team dynamics. Participant D3 noted that "people are just intense outside of the technology, there are complexities without the technology and with the technology there is an added level of complexity."

Participant D2 added that:

> "There were a few challenges where personalities came into play where there was a misunderstanding in communication. Some individuals are more aligned to being direct, and if somebody is not comfortable with having that direct kind of communication, it can lead into a defensive type of discussion."

Participant D5 offered that a way of dealing with conflicting personalities was to use the technology to one's advantage where one could just:

> "... turn off your camera, turn off your mic [laughs], sit back, collect yourself and then engage again instead of ... boiling over?"

iv. Different motivations levels

Participants were also aware that different team members had different motivations, and this impacted on the level of effort. Those with higher motivation tended to carry more workload in an effort to ensure better results. Participant D5 exclaimed that:

> "You have people and their output level is much higher. Some people were just happy to settle with a 60 or 65 and other people a 70 or 75."

Participant D6 supported Participant D5 and added that those with higher work ethic tended to carry more workload:

> "But given the different levels of work ethic and you had people in the team just looking to pass; you had other people just looking to get first. So, I think that those A-type personalities picked up and drove the product with the project across the line."

v. Different work ethic

Participants were aware that there were different work ethics among the team and that they had to work together to bring about balance so that they do not have the same people always carrying the team. To deal with this disparity, some teams formed relationships outside the projects, where they could talk to specific individuals in a neutral environment, about their work ethic.

Participant D6 summed up by adding that:

> "I think the peace here is there was always support."

5.5.4. Conclusion to Research Question 2

Table 5 below summarises the codes that form the themes discussed in this section relating to Research Question 2.

Table 5: Summary of themes and codes for Research Question 2

Themes	Codes
5.5.3.1 Psychological Safety	i. Feel safe environment
	ii. One-on-one intimacy
	iii. Empathy towards participant preferences
5.5.3.2 Knowledge Sharing	iv. Expert networks
	v. Share specialist knowledge
5.5.3.3 Confirmation Bias	vi. Full ownership in area of expertise
	vii. Individual biases
	viii. Competently skilled in area of specialisation

Themes	Codes
	ix. Inherent biases
5.5.3.4 Conflict	x. Different effort levels
	xi. Conflict
	xii. Conflicting personalities
	xiii. Different motivation levels
	xiv. Different work ethic

Source: Author

Participants elaborated that dealing with complex tasks in virtual project teams, generated both positive and negative effects. Participants experienced positive effects such as the formation of psychological safety as well as knowledge sharing. Participants explained the importance of creating environments where team members could openly and freely share their views without fear of being judged. Knowledge sharing was deemed as important and where necessary, external subject matter experts were consulted. In contrast, participants experienced negative effects of complex tasks on virtual project teams such as confirmation bias and conflict. Participants elaborated that where there was individual or team confirmation bias, the team could derail from the project and deliver sub-standard results. Dealing with conflict virtually was a challenge as participants could not read each other's body language in order to ascertain appropriate responses.

5.5.5. Research Question 3: How does the sharing of leadership across team members support task complexity in a virtual project team?

The aim of this question was to ascertain if team members were aware of the dominant leadership styles in their virtual project team. This question also sought to understand the specific leadership traits that were deemed as most important by the participants. Leadership themes that emerged because of this question included participative leadership, situational leadership and shared leadership. Furthermore, traits that emerged were coaching and mentoring, trust, consensus as well as empathy. These are discussed in detail below.

5.5.5.1. Shared Leadership

A form of leadership that emerged according to the greatest number of participants was shared leadership. Participants explained how every member got involved in projects and how the leadership role was often rotated. Participants also mentioned that in some cases, some team members would jump in to take the lead based on their expertise.

i. Everyone takes ownership

Participants agreed that in shared leadership, everyone took ownership and responsibility of the task at hand. It was also important to maintain respect and a safe space for team members to express themselves while taking the lead. Participant D4 articulated this as follows:

> "They don't necessarily need to be the team leader, so in all assignments that we had, even though we appointed a team leader… everybody pulled through to try and make a success of this and everybody respected other people's views without themselves feeling undermined or side lined, or disrespected in any way."

Participant D9 added that team members would raise their hands to take the lead:

> "It was shared leadership. 1) we rotated chairing of meetings, and 2) we also rotated project leads. So, for each assignment there was someone who actually would say 'I will lead that'."

ii. Reduces pressure and creates excitement

According to some participants, the sharing of leadership eased pressure on the team and created excitement for better results. This was expressed by Participant D3:

> "There would be pockets where in shared leadership everybody is taking ownership. And usually then those are instances where there is less pressure on the team members and there is more excitement alignment around the tasks."

iii. Rotate leadership

Participants also mentioned the importance of rotating the leadership role as well as process to afford each member the opportunity to lead and to keep all team members engaged. Participant D14 commented that:

> "I think shared leadership, because we would share and rotate leadership. Each person had an opportunity to lead an assignment."

iv. Cannot be hierarchical

Participants stressed that in shared leadership, there can be no hierarchy. Participant D2 articulated the nature of shared leadership in his team, with a specific mention on members being equal and there being no hierarchy:

> "So definitely I think the shared leadership worked because it managed a team in the sense that everybody was equal and there wasn't any kind of a hierarchy, so it flattened out the team structure so that we can all feel comfortable to share as required."

Participant D12 also added on the comment about equality and absence of hierarchy:

> "We are definitely on a shared leadership approach that is not having a hierarchy, discussing everything, sharing all tasks equally and allowing any inputs from any one of the group members, was welcomed."

5.5.5.2. Participative Leadership

Participative leadership emerged as one of the dominant leadership styles among team members in virtual project teams. Some participants pointed out that team members often volunteered where necessary, to take the leadership role. Participants also gave examples of why they believed this leadership style was most dominant in their teams. The specific codes that relate to this theme are discussed below.

i. Aspects of Participative leadership

Participants agreed that participative leadership was prevalent within their teams. This was evidenced by instances where all team members took a leadership role at some point and where there was no hierarchy.

Participant D12 pointed out that:

> "We are definitely on a shared/participative leadership approach that is not having a hierarchy, discussing everything, sharing all tasks equally and allowing any inputs from any one of the group members."

ii. Voluntarily extend effort

In some cases, team members volunteered to assist or lead even in areas or tasks which were not assigned to them. This was done in the best interest of the team and in an effort to produce quality results.

Participant D12 articulated this by saying:

> "So, I think when everything is so open like that it allows people to put their hand up and say 'I have got this skill, I am going to take the lead on this one'."

5.5.5.3. Situational Leadership

Few participants pointed out to the emergence of situational leadership within their groups.

i. Aspects of situational leadership

Participants pointed out that they experienced this type of leadership in the following scenarios:

According to Participant D3:

> "There is one which is also called situational leadership, or situational awareness; when you would find that someone shifting across all different levels."

Participant D4 also added that:

> "Knowledge sharing, teamwork, situational leadership or situational working, let me say situational leadership"

5.5.5.4. Trust

Participants pointed out that trust was important among team members. According to the participants, sharing the same vision, being invested in the tasks at hand, delivering on promises, communication and openness were key to building trust. The specific codes that emerged within this theme are discussed below.

i. Communicate to build trust

The participants mentioned that communication was a key ingredient to building trust. It was important for team members to verbalise their expectations of each other and to constantly communicate in alignment to the vision and goals of the team.

Participant D3 succinctly opined that communication was essential in building trust:

> "What I am saying is that then the element of trust comes from communication…"

ii. Time to build trust

Participant D1 commented that building trust took time. In her own words, “the trust element took longer to develop.” She gave examples that the team needed to work together on a few projects and when team members consistently delivered on allocated tasks, trust was then built.

Participant D5 also added that:

> “I think it was after the first couple of assignments ... you kind of gauged ... working more with people. You kind of gauged: Okay, I can trust that if I give someone this to do - they will be able to execute it.”

iii. Work outputs build trust

Participants noted that consistently delivering on allocated tasks helped to build trust. This was summed up by Participant D9 when he said:

> “I started trusting the team members because they actually delivered on what they said they would do and we just took it from there.”

Participant D8 supported Participant D9 by adding that:

> “As you give small tasks to persons and say do this you build up the trust and that enabled everybody to pull together.”

iv. Conscious establishment of trust

Participants elaborated that building trust was a conscious effort with virtual project teams. They pointed out that team members reached out to each other to seek or to offer help and this was a form of conscious effort to build trust. Participant D9 commented that “that had to come with some level of accountability and then because of accountability we were able to build trust”.

Participant D14 gave an example that:

> “Even if we had a leader, if they knew they were weak in presentations, they would be quick to ask for someone who is good enough to do the presentation and they facilitate the discussion. Honesty and transparency made it easy to build trust.”

Participant D13 also added that holding oneself accountable and committing to not letting the team down also contributed to building trust:

> "…the trust around each other to deliver the objective, really comes from individual push for their own accountability in delivering."

v. Feel safe environment

Participant D4 argued that "trust is an interpersonal thing". To this end, participants recognised that team members needed to create an environment where all members felt safe to interact and give their input. Participant D5 also added that the safe environment that they created resulted in "quieter people in the group becoming more confident to share". Participant D4 also added that within a safe environment, team members "tend to be a little more open, you tend to understand them more, they tend to be more honest about feedback. They tend to be more honest about their feelings and their views." Such an environment was therefore necessary to facilitate the process of building trust among team members.

Participant D9 also added about openness and communication:

> "So, we spoke about trust, accountability, collaboration, participation. I would say an understanding, understanding of compromising right? And that came about once when members actually spoke up…"

vi. One-on-one intimacy

Participant D1 explained how part of the process to building trust involved one-on-one conversations with specific team members to establish rapport and create a safe interactive environment. She pointed out that:

> "So, I think from that perspective it also has to take one on one, you can't only rely on a group interactive format to build a relationship like that."

vii. Trust building characteristics

Participants also highlighted some of the characteristics and conditions that contributed towards building trust among team members. These included communication as well as establishing a common vision.

Participant D3 elaborated by saying:

> "What I am saying is that then the element of trust comes from communication one, but two from the understanding that then different people are vested in the task being successful."

Participant D15 also added that:

> “Well for the building of trust I would say that you know it depends on the shared vision you have.”

5.5.5.5. Consensus

Reaching consensus was a contentious issue among participants. Participants mentioned that diversity within groups as well as different leaderships styles often resulted in a challenge with reaching consensus. Most of the participants leaned towards democracy as the overriding principle to make decisions. The prevalent codes within this theme are discussed below.

i. Consensus

According to the participants, it was clear that reaching consensus within the group on actions and direction was important. Participant D6 elaborated that “establishing, buy-in and mutual understanding upfront was very important.” This consensus paved way for better collaboration and better results.

Participants also pointed out that reaching 100% consensus was a challenge, this was mentioned by Participant D13:

> “Obviously there is a lot of engagement, but it is not on the extreme, but it allows everyone to be aware of why the decision has been made and not to say that the consensus must be 100%, but when consensus was made that such consensus is supported by the wider group.”

Participant D1 also mentioned how difficult it was to reach 100% consensus and how they then had to lean on democracy:

> “Democracy rules, period! And then I can honestly say there was never 100% consensus on anything because of the diversity. However, the democracy mechanism is necessary in the interest of time.”

ii. Consensus-led leadership

Participant D7 added that leadership played an important role in managing consensus:

> “I think it made it fairly easier, because the fact that we had this nominated team leader for the particular task ... at the end of the day if there was a general consensus ... the leader went along with it. But if there was an area or a time where there was a dispute or disagreement, it was then the leader's job to mediate it, to understand the opposing views.”

Participant D11 also added that participative leadership made reaching consensus easier:

> "But that does make decision-making, because it is more participative and everyone has got their view, you get more of a consensus of views, but it is as easy decision-making."

iii. Shared vision

Participant D15 pointed out that "if the team doesn't have the same vision or ambition you are not moving in the same direction". This encapsulated the need for a shared vision within team members. Participants explained that shared vision made it easier to reach consensus as the vision pointed out the goals which all members agreed to. This was pointed out by Participant D1 when she explained that:

> "And then we actually performed well, we got 80 for our assignments because everyone came prepared because everyone knew what was expected."

iv. Everyone takes ownership

Participant D3 elaborated that team members would take ownership of their allocated tasks regardless of who was the project lead:

> "Everybody takes ownership to a certain extent, they participate once if there is a meeting; they participate to discuss and contribute and so on; they take the task, go and deliver and come back. And in certain instances, then really there would be pockets where in shared leadership everybody is taking ownership."

5.5.5.6. Coaching and Mentoring

i. Expert networks

Participants pointed out the importance of creating an environment where accessing both internal and external subject matter experts was key. This strengthened the team and allowed for coaching and mentoring among each other, as well as external experts. Participant D5 gave an example where they:

> "were quite surprised with one of our assignments, one of our ... one of the group members went out and spoke to their own personal financial advisor"

ii. Coach members to show up stronger

Participant D8 elaborated that giving feedback in an appropriate way was important. She pointed out that it was vital to provide constructive criticism as opposed to being destructive. This allowed team members to coach and support each other towards reaching team objectives.

> "Where you see that this portion needs a bit of work, you comment to a person and say, you can also add this, because this is how it goes. Then people receive it better than when you say, this is actually wrong."

iii. Peer coaching and guidance

Participant D5 commented on how they enjoyed peer coaching and guidance. One of the team members was affluent with technology and took time to teach fellow team members how to use different technology tools.

> "He actually taught us quite a bit you know. Different stuff you can use... He also introduced us a bit more to shared drives when we only used One Drive, and stuff like that."

iv. Learn and be influenced

Participants stressed that it was important for team members in a virtual project team to be open-minded and welcome other views as this allowed for better flow of communication and collaboration.

Participant D6 pointed out that:

> "I think the strange part is there was open-mindedness from the leadership perspective; so, you wanted everyone to contribute and feel like they were contributing."

v. ICT skills training

Participants were cognisant of the differing competencies across team members relating technology. Participants competent in these skills assisted with upskilling fellow team members. This strengthened relationships, improved collaboration and allowed team members to focus on key tasks rather than fiddling with technology.

Participant D6 pointed out that:

> “I am very familiar with the technology and how it works. So, I did the setup, I did the training; I tried to help where I could with the rest of the guys, but that was a lot of stuff that I knew.”

vi. Greater learning than face to face

Participant D5 added:

> “So, I think ... I don't know if it was the most effective thing... but a lot of the time there were discussions outside of meetings. So, talking about ... you now, this is what’s happening... This is where we find stumbling blocks and getting a bit of support before a meeting. To say: Guys, look. Last time we wasted a lot of time ... XYZ. This is kind of what we meant ... this is kind of where we were going ... do you agree? Don't you agree? What do you agree with? What don't you agree with? And I think that was one of the biggest things to build that support system.”

5.5.5.7. Empathy

Participants gave examples of being empathetic towards one another. They understood that they all had different and competing priorities, and this could result in any one of them seeking understanding and assistance from others. Participants were understanding, tolerant and made efforts to accommodate each other as much as possible.

i. Empathy improves communication and collaboration

Participant D8 pointed out the benefit of having team members that one could talk to when they needed support:

> “But I think the fact that each person had a go to person that they can talk to besides the academic world that also helped quite considerably.”

Participant D14 elaborated that they were more understanding and empathetic to one another, and this enabled them to communicate and collaborate better:

> “We have been able to understand each of our team members lifestyles and accommodate each other. For example, moving a meeting time to 8pm because we may know that some members are home-schooling their kids, and by 8pm at least the kids are in bed. That allowed us to be able to contribute and work together to the best of our abilities, because we can accommodate each other’s personal lives.”

Participant D5 pointed out that communication was key in supporting each other:

> "I think that was because people were engaged and communication about what we were doing was most important and I think also we supported each other. We were very understanding. If someone had an issue, we tried to work around it. It wasn't ... you know ... this is what is happening ... change everything ... be there! You know, if someone was ... like a said ... we had people that worked in mines ... people that worked elsewhere... So, if someone had an issue and they were going to be late and things like that ... we tried to shift, you know ... shift things around to make sure that they were included and not just start and catch up when you can. So, I think, definitely that supportive function ... communication ... and also trying to help people..."

ii. Empathy towards participant preferences

Participant D3 pointed out that alternatives were used to accommodate team members' preferences:

> "We would ordinarily use MS Teams for meetings but then, if it is not working out on that day, then we have to find an alternative, right. So, we decide okay so, let us use Zoom today even though we already have an appointment set in MS Teams; let us rather go and try Zoom so that we can be able to accommodate everyone else."

Participant D6 echoed Participant D3 by adding that:

> "So, we were a lot more accommodating in terms of disruptions of people not being available. So, if people were not available, the rest of the team continued and we made a concerted effort to actually then communicate anything to anyone that did not make it to the session for instance."

In contrast to the above participants, Participant D7 appeared to lack empathy. This came out when he said:

> "Not everyone may have the same financial means ... but things like GIBS allowing us free Wi-Fi. Things like data costs are not exorbitantly high. And not all meetings are ad hoc. They are all pre-planned well in advance. So, for me, it does create that perception of the person. That this person just doesn't care as much as I do. And why would I then want to work with this person,

because I can only imagine in their own professional life, how they must be perceived by their own colleagues, co-workers, line management, etc."

5.5.6. Conclusion to Research Question 3

Table 6 below summarises the codes that form the themes discussed in this section relating to Research Question 3.

Table 6: Summary of themes and codes for Research Question 3

Themes	Codes
5.5.5.1 Shared Leadership	i. Everyone takes ownership
	ii. Reduces pressure and creates excitement
	iii. Rotate leadership
	iv. Cannot be hierarchical
5.5.5.2 Participative Leadership	v. Aspects of participative leadership
	vi. Voluntarily extend effort
5.5.5.3 Situational Leadership	vii. Aspects of situational leadership
5.5.5.4 Trust	viii. Communicate to build trust
	ix. Time to build trust
	x. Work outputs build trust
	xi. Conscious establishment of trust
	xii. Feel safe environment
	xiii. One-on-one intimacy
	xiv. Trust building characteristics
5.5.5.5 Consensus	xv. Consensus
	xvi. Consensus led leadership
	xvii. Shared vision
	xviii. Everyone takes ownership
5.5.5.6 Coaching and Mentoring	xix. Expert networks
	xx. Coach members to show up stronger
	xxi. Peer coaching and guidance
	xxii. Learn and be influenced
	xxiii. ICT skills training
	xxiv. Greater learning than face to face
5.5.5.7 Empathy	xxv. Empathy improves communication and collaboration
	xxvi. Empathy towards participant preferences

Source: Author

Participants pointed out that leadership was an important aspect in virtual project teams. This leadership could be participative, situational or shared. What was important was that there was consistency within leadership and that team members shared the same vision, and the environment was conducive for members to express themselves. Where there was a deadlock, democracy prevailed with a simple majority vote. Building trust came out as one of the strong themes. Participants pointed out that this was an interpersonal matter and needed time and appropriate spaces to be developed. Some participants explained that consistency in terms of delivering on agreed outputs helped to build trust. According to the participants' lived experiences within virtual project teams, reaching consensus proved to be a challenge for some participants, however, to overcome this challenge, participants resorted to setting ground rules upfront. Having a shared vision also went a long way in assisting with consensus. Participants also pointed out that empathy helped to improve communication and collaboration.

5.6. Conclusion

This chapter presented the results from the conducted interviews and in line with the research questions listed in Chapter 3. The findings were presented in themes as they related to the research questions. Participants presented interesting views relating to the topic of this research. Most of the findings were consistent with literature presented in Chapter 2. The findings revealed that technology can play both positive and negative roles in the development of virtual project teams. Shared leadership and task complexity also played important roles towards establishing common goals for the team and improving collaboration and team performance. Chapter 6 below discusses these findings in more detail.

6. Chapter 6: Discussion of Results

6.1. Introduction

This chapter discusses and interprets the findings of the study in relation to the research questions posed in Chapter 3 and the results presented in Chapter 5 in accordance with each research question, following the thematic analysis approach. The objective of this chapter is to review and interpret these findings in line with the existing literature provided on ICT, task complexity and shared leadership in virtual project teams as set out in Chapter 2.

6.2. Research Question 1: How does technology play a role in the development of virtual project teams?

The aim of this research question was to understand the role that technology plays in the development of virtual project teams and how it may contribute towards or negate effective team outcomes. Participants confirmed that technology did play a role in the development of these teams. According to the participants' lived experiences, this role included the ability if ICT to enable/disable and improve collaboration, to enable/disable and improve communication, to enable flexibility with the virtual team, to increase/decrease the digital divide as well as enhance/worsen the challenge associated with the lack of face-to-face interactions encountered by virtual project teams.

Laitinen and Valo (2018) argued that technology not only "enable[s] multiple, often geographically dispersed, participants to communicate simultaneously, but also facilitate[s] multiple communication functions, such as information sharing, negotiating, problem-solving and team decision-making." Participants confirmed that technology enabled seamless communication and information sharing among virtual project team members. Participant D11 added that technology allowed team members to communicate at any time by stating that "making use of WhatsApp [for example], as there was no one who didn't have a phone on them 24/7". This example is consistent with Laitinen and Valo's (2018) assertion that technology enabled communication among geographically dispersed participants. The example cited by Participant D11 demonstrates that even in the case where virtual team members lived in different time zones, they would still be able to communicate with each other throughout the day by using technology. This ability to communicate at any time also increased the frequency of communication amongst team members. Participant D11

pointed out by saying “there was no one who doesn’t have a phone on them 24/7” and this meant that through the use of technology platforms such as WhatsApp, as soon as a team member posted something about a project, other team members could immediately receive the information, engage and provide input instantaneously as opposed to waiting for the next official project team meeting. This finding of 24/7 communication has direct bearing on management support as well as organisational policies such as those that govern working hours. Additionally, this may impact on legislation that governs basic conditions of employment which prescribes for specific amounts of hours for work and for breaks. Some of questions in terms of these policies and legislation now become, what happens when virtual project team members work from 4am from their respective homes, does it follow that they will knock off at 1pm? How are their breaks regulated?

Participants also pointed out that technology enabled communication by lowering communication costs, thereby reducing some of the barriers to communication. According to Sillars and Vangelisti (2018), “communication is seen as the means by which people construct and maintain relationships.” Therefore, it follows that virtual project teams needed to communicate as much as possible and as frequent as possible in order to construct and maintain team relations. For frequent communication to occur using technology, it was important to eliminate challenges associated with costs. Participant D3 confirmed that virtual project teams could use technology platforms such as WhatsApp “to communicate on an ad hoc basis and send information across”, resulting in an increase in the frequency of communication. He also added that technology “reduces the communication barrier in terms of formality”. His sentiments were that face-to-face communication was a barrier and team members needed to show up more formally in terms of appearance, language and tone. These perceived barriers were reduced on platforms such as WhatsApp. This is consistent with Sillars and Vangelisti’s (2018) assertion that other sets of skills or skills deficits contributed to relationship adjustments within virtual project teams.

Participant D3 mentioned that if a team member was not confident in terms of speaking in front of others, technology platforms provided an environment where this perceived skill deficit, which may be a barrier to communication, was now reduced as the technological platform aided this member to communicate in a less formal face-to-face environment. Participant D4 also added that technology resulted in cheaper communication costs among virtual team members. This also meant that

communication was more frequent, which helped to construct and maintain virtual project team relations.

While technology played a positive role in enabling communication across team members, it also posed some challenges. Hadjiev (2018) pointed out that some of the challenges ranged from issues such as incompatibility with software and hardware to technology literacy levels among team members. Participant D5 corroborated Hadjiev (2018) and confirmed that "…there were challenges ... getting the technologies to work the same as everyone wants…" This highlights that technological incompatibilities created a challenge in these teams, which led to communication breakdowns and negatively affected project outputs.

Popescu and Warmenhoven (2019) indicated that the absence of non-verbal cues such as facial expressions, hand movements as well as tone of voice posed challenges to virtual project team communication. Participant D11 confirmed the findings by Popescu and Warmenhoven (2019) and added that in the absence of nonverbal cues, chaos emerged in some of the project meetings, where team members were talking over each other as they could not see and read each other's non-verbal cues. She added that sometimes there would be prolonged silence or ideas would get lost as team members were waiting for an opportunity to speak, but other members could not see them and therefore not give them the opportunity to speak. By the time an opportunity to speak came, the idea was already lost, and some team members would have already moved on from that point, resulting in a poor communication flow.

Poor technological infrastructure emerged as another challenge that hampered communication within virtual project teams. Participant D5 and Participant D15 spoke about their frustrations with issues like load-shedding and the lack of a good or no network signal. When load-shedding was present, team members would automatically drop from the call or their connectivity signal would weaken, resulting in lost or distorted communication. Participants pointed out that such occurrences also hindered the flow of communication.

In addition to enabling and facilitating communication, participants pointed out that ICT allowed for improved collaboration among team members. Team members explained that ICT allowed them to work in isolation and then share their input for consolidation. This was echoed by Participants D10 and D2 who provided examples

of cloud solutions such as the Google Drive that enabled better collaboration. Participant D1 also added that such technologies were effective for gathering and consolidating information. These experiences were consistent with the work of Scoular et al. (2020), who pointed out that collaboration is about team members' ability to contribute meaningfully within the team.

Participants also stated that connectivity via the internet helped to link team members and processes. This was evident as team members could work on the same document simultaneously, without overriding each other's work while also viewing each other's thought process and progress on work done. This was consistent with Choi and Cho (2019), who posited that collaboration was about cooperation, coordination and knowledge sharing. It is clear that technology enabled the participants to cooperate (agreeing on cloud solutions for collaboration), coordinate (authoring the same document without overriding each other's work) and share knowledge (seeing each other's thought process on the same document and then providing input).

Participant D3 confirmed that internet connectivity helped in linking team members to processes and added that technology allowed team members to use multiple platforms to support these processes. In addition, Participant D1 added that the multiple platforms made it easier for the team to monitor and track progress across team members. This meant that team members were constantly communicating and engaging online about the tasks and projects at hand. As outlined by Morrison-Smith and Ruiz (2020), constant communication in virtual project teams was critical as it enhanced collaboration, established boundaries and defined roles and responsibilities to mitigate the risk of work duplication as well as misalignment between members. The ability for the participants to monitor and track each other was deemed important as it improved collaboration.

One of the topics that inherently emerges when discussing ICT within the African context is the concept of the digital divide. Rogers et al. (2020) posited that the digital divide can "dampen the development of intrateam cohesion, trust and communication" within virtual project teams. Participant D7 agreed with this and elaborated on how he always had uncapped high speed fibre internet at his home and how frustrated he was by team members who had an unstable internet connection. On the other hand, Participant D15 lived in Soweto and had poor connectivity. With these two participants having to work together, it was evident that

team cohesion, trust and communication between them could be dampened (Rogers et al., 2020). Participant D7 could be led to believe that Participant D15 was not committed to the team by not investing in proper internet connection, resulting in their distrust towards Participant D15. On the other hand, Participant D15 could feel that Participant D7 was not empathetic enough and believed that he (Participant 15) was always making an excuse for not being available online when needed. Added to this complexity is the unique South African experience of load-shedding. Participants pointed out that power supply interruptions such as load-shedding negatively impacted connectivity and thereby widened the digital divide. From these experiences it is evident that the digital divide continues to exist and could negatively affect the virtual project team's environment.

Nyahodza and Higgs (2017) argued that lack of technological skills contributes to the digital divide. Participant D12 provided an example where they had an older team member who was not proficient with ICT. He pointed out that having to work with this member was a challenge because when they had to take the lead and manage ICT software, they often took longer and created a burden on other members as they had to assist. This also proved difficult as they could not teach the member how to use the technology efficiently because they were not in the same physical space.

On the other spectrum, some participants mentioned that technology assisted with bridging the digital divide. Participants D1 and D2 elaborated on how they used technology to share information relating to the project on as many platforms as possible. This ensured that if a team member could not access a particular platform or was experiencing issues with this platform, they could make use of another platform to keep abreast of the project instantaneously. Participants also added that technology allowed for meetings to be recorded and shared with team members who could not attend the meeting. This facilitated collaboration and ensured that all team members were always aligned and where there was ambiguity, team members could refer to the recording or notes provided in order to realign themselves.

In addition to the above, ICT allowed for flexibility among virtual project teams. Participants mentioned how technology assisted them with being flexible to attend project meetings, which platforms to use as well as flexibility in terms of formal and informal interactions. Participants D5 and D8 pointed out that technology allowed them to be flexible in terms of meeting times, task allocation as well as collaboration. Where some members could not attend meetings, technology allowed for these

meetings to be recorded and shared so they would be kept up to date with related tasks, projects and discussions.

Participants D1 and D3 also elaborated on how technology allowed for flexibility in terms of the platforms they could use. They could use either MS Teams, Zoom or WhatsApp for their meetings. They added to this by discussing their experiences when they said they used WhatsApp more for informal communication among team members, while MS Teams and Zoom were used for more formal communication and interactions. As a result of the limited literature available relating to flexibility in virtual teams, the researcher proposes this as a topic for future research.

Some participants pointed out that while technology enabled better collaboration, communication and allowed for flexibility within teams, it also reduced physical human interaction. Participant D7 commented on how face-to-face interactions that enabled team building were not as strong in virtual project teams (Lechner & Mortlock, 2021). Participant D2 supported this by saying that this had created superficial and unreal interactions where team members could not really engage interpersonally and could therefore not necessarily build high-quality relationships (Lechner & Mortlock, 2021). Participant D10 also pointed out that in the virtual environment, there was loss of intimacy as it was easier for team members to hide behind the screens.

6.3. Conclusion to Research Question 1

In summary and in relation to the research question, participants confirmed that ICT plays a role in the development of virtual project teams. This role included ICT's ability to bridge the digital divide as well as to enable better collaboration by allowing team members to use cloud solutions to work on the same document along with monitoring and tracking each other's progress without overriding each other's work. ICT also played a role in enabling frequent communication among team members, which resulted in enhanced collaboration and improved performance. As a result of the limited literature available relating to flexibility in virtual teams, the researcher proposes this as a topic for future research.

6.4. Research Question 2: How does task complexity affect working in a virtual project team?

This research question sought to understand how task complexity positively or negatively affected working in a virtual project team. The aim was to understand what

behaviours were triggered when a virtual project team was dealing with complex tasks. Participants discussed behaviours such as knowledge sharing, psychological safety, confirmation bias as well as conflict.

Psychological safety was a dominant theme in relation to Research Question 2. Lechner and Mortlock (2021) argued that virtual project teams needed safe spaces where team members could display their vulnerability and were free to confront uncomfortable discussions, especially when dealing with complex tasks. Participant D13 confirmed that their team created this safe space when he described it is “you are in a safe space and we can robustly engage with a topic without having to be at each other’s throats.” Participant D11 added that such spaces were created out of mutual respect and to allow all team members to have a voice. Based on these experiences, it becomes clear that where team members do not feel safe to voice their input, particularly on issues relating to complex tasks, communication is likely to break down and collaboration is likely to suffer, leading to poor team outcomes.

Some participants pointed to the importance of fostering one-on-one intimacy among virtual project team members. Participant D8 explained that they often went beyond relations as prescribed by the project and made a concerted effort to get to know each other at an individual level. This helped team members gain confidence to speak to other team members offline in order to seek clarity where they did not understand something about a complex task. This, in turn, improved collaboration and led to better outputs. This was consistent with Rosen et al. (2007), that virtual project teams needed safe spaces where they could freely share ideas, offer constructive criticism or simply to ask for help. For the participants, the creation of such safe spaces enhanced the culture of knowledge sharing and created an environment where some team members were empathetic towards those who had different ICT preferences or those who had ICT challenges. As an example, Participant D3 explained how they would be more understanding in noting that not all team members had the same comfort in the use of technology. They would then be more empathetic towards such members and allow them time to get acquainted with the technology, or they would offer alternatives or any assistance. This helped to strengthen team cohesion and collaboration.

In addition to creating safe spaces for team members to express themselves, participants pointed out the necessity and importance of sharing knowledge and information with each other, with the aim of reaching a common goal. Participant D5

explained how the team created bridges that allowed for access to expert advice from outside the team. This manifested when one of the team members reached out to his personal banker to get information that would help the team on their project. This behaviour was consistent with Rosen et al. (2007) assertion that knowledge sharing included "bringing new knowledge into the team from the external environment." Participant D3 also added that within the team, it was important to rely on each other's strengths and it was vital that those who had information shared it in the team. As per Alsharo et al. (2017), this sharing of knowledge positively influenced trust and collaboration within the team. This was true as Participant D3 confirmed that team members relied on each other more and built trust among each other, as they knew that each member would deliver on given tasks. This environment was also consistent with Hong and Vai's (2008) findings that knowledge-sharing within virtual project teams relied on shared understanding as well as creating a learning climate. This was corroborated by Participant D3 when he added that "we all had to put in our part to make sure that we deliver on a particular task". This is evidenced by the fact that the team shared a common understanding that each member needed to lean on their strengths and contribute towards achieving the common goal.

Although task complexity brought about positive results in the form of knowledge sharing and psychological safety among teams, it also created some challenges. These manifested in forms of confirmation bias, conflict as well as difficulty in reaching consensus. Confirmation bias could occur at individual or team level (Cassell et al., 2019). Participant D11 explained that sometimes it was difficult to moderate individuals' confirmation biases, and this resulted in weak team performance. He also added that he experienced team confirmation bias as the team was clouded by inherent shared biases. These experiences confirm Gatlin et al. (2017) findings that confirmation bias may negatively impact the accuracy and quality of decision-making within a team, thereby leading to poor performance. Participants D13 and D14 presented viewpoints that appeared to contrast Gatlin et al. (2017) in terms of quality decisions. These two participants explained that they expected team members to take full ownership and lead projects where they had better expertise. In such cases, team members did not worry about the individual's confirmation biases as their focus was on the individual's expertise and their ability to lead the team. In addition to this interesting viewpoint, Participants D1 and D6 added that they expected team members to be competently skilled in their respective areas of specialisation. Participant D6 provided an example where if a team member worked

for a financial services institution, other team members expected this member to know every aspect of finance. Such experiences may have placed undue pressure on the specific team member and even encouraged confirmation bias within these team members. This could easily lead to poor quality decisions or even poor performance as those who are perceived to be experts may be given the freedom to make decisions without consulting the team. Should such individuals make incorrect decisions, such decisions are binding to the whole team. However, should they make better decisions that benefit the team, then the confirmation bias is perpetuated.

One of the challenges brought about by task complexity into virtual project teams was the emergence of conflict. Participant D13 gave an example that conflict often occurred when team members expected different levels of effort from others compared to what those members could actually deliver. This example confirms Sasikala et al. (2021) assertion that conflict would arise when team members perceive other team members to be opposing the team's efforts towards reaching a common goal. Indeed, it does follow that if team member 1 expects team member 2 to produce X towards the project and team member 2 goes on to produce Y, team member 1 may perceive team member 2 as opposing and denying the team to achieve its goals. This will invariably lead to conflict and may negatively impact on team relations and collaboration.

In addition to levels of effort, different motivations also contributed to the emergence of conflict. Participants D5 and D6 pointed out that some team members in their virtual project teams were satisfied working to gain average results while others were motivated to attain top results. This also added to the explanation that those who wanted to attain top results would perceive those who were happy to settle for average results as opposing the achievement of team goals. This would also lead to conflict and in some cases, those who were motivated to achieve more would often pick up more of the workload in an effort to push everyone else up. Participants also indicated that in order to avoid or mitigate conflict, sometimes it was better to agree on the required deliverables upfront. Such approaches were in line with Turesky et al. (2020) who encouraged that conflict needed to be addressed with urgency and in a direct, honest and transparent manner. Agreeing to the deliverables upfront assisted team members to easily bring those who were perceived as being opposed to the achievement of team goals back in line. It was easier to refer to the agreement and point out what was expected and how it had not been met.

6.5 Conclusion of Research Question 2

Reflecting on the research question about how task complexity affects working in a virtual project team, some interesting findings have been identified. These findings propose that task complexity can affect working in a virtual project team both positively and negatively. Task complexity affects working in these teams positively by promoting knowledge sharing and creating safe spaces for team members to freely express themselves towards achievement of team goals. In contrast, task complexity may also affect working in a virtual project team negatively when there is individual or team confirmation bias as this can lead to poor performance. Additional, task complexity can also affect working in these teams negatively in instances where there is conflict because of misaligned team members' expectations in terms of effort required and motivation.

6.6. Research Question 3: How does the sharing of leadership across team members support task complexity in a virtual project team?

This research question aimed to understand how shared leadership can support complex tasks in virtual project teams. Participants pointed out that leadership does support virtual project teams when dealing with complex tasks. This leadership could be shared, participative or situational. Participants also pointed out the importance of coaching and mentoring, trust, consensus, as well as empathy when working in these teams.

Participant D12 explained that he experienced participative leadership within his team. This was characterised by the absence of hierarchy and an open platform for all team members to engage where some team members volunteered to take the lead where they saw fit. While this leadership style was not within the scope of this research, one could argue that participative leadership is an emergent state as per Dulebohn and Hoch's (2017) IPO framework. Considering this, it may be worthwhile to conduct further research on the role of participative leadership within virtual project teams. Similar to participative leadership, Participant D3 argued that he experienced situational leadership in his team. As this research did not focus on both situational and participative leadership styles, these were not probed further in order to understand the roles they played.

Consistent with Cao et al. (2012) as well as Eisenberg et al. (2016) that shared leadership was more effective across virtual team contexts with greater task

complexity, most participants argued that they experienced shared leadership in their teams. This was characterised by the rotation of leadership roles, involvement and engagement of all team members as well as a lack of hierarchy. Participants D4 and D9 gave examples of team members taking ownership of tasks at hand, even when they were not project leads. Participant D3 added that shared leadership reduced pressure on the team and created excitement to achieve. These examples confirm the assertion by Zhu and Lee (2017), that shared leadership is emergent and is characterised by sharing leadership responsibilities within a team where all team members influence each other to achieve team goals. The experiences of these participants also agree with Hoch (2013) that shared leadership fostered innovation and is characterised by collaborative decision-making and shared responsibility for better outcomes.

Participants D12 and D14 articulated that there needed to be equality within the team in terms of leadership and that the team needed to develop mechanisms to rotate and to distribute leadership influence and roles. The comments about developing mechanisms to rotate leadership roles were in line with Scott-Young et al. (2019), who argued that relationships between team members emerge, co-evolve and change throughout the entire life cycle of the project. Therefore, it was vital and fair for leadership roles and influence to be exchanged among team members in order to increase engagement and improve innovation. Where possible, it was important to share these leadership roles based on knowledge, task expertise and competence, to foster efficient project team functioning. This was succinctly articulated by Participant D4 that “everybody pulled through to try and make a success of this…”.

Choi and Cho (2019) ascertained that complex tasks needed higher levels of trust. Eisenberg et al. (2016) argued that shared leadership helped meet the need for coordinated efforts, resulting in a natural connection to task complexity in teams, which fosters trust, improves communication and cohesion. Participants also confirmed that trust was important while rotating leadership and dealing with complex tasks. Participant D3 argued that communication was essential to building trust, while Participant D1 added that it took time to build trust. From these experiences one can deduce that, concurrent to shared leadership being emergent, trust also emerged as the team worked together more often. On the other hand, Alsharo et al. (2017) found that trust positively influenced collaboration within virtual project teams. Participant

D9 added that sharing of tangible work outputs helped to build trust. Therefore, the longer team members worked together and the more they delivered on the required outputs, the more trust was built.

Participants added that building trust was a conscious effort that needed some level of accountability. They also pointed out that there needed to be an environment where team members felt safe to interact and share their input freely. Safe spaces were important as Alsharo et al. (2017) pointed out that trust included vulnerability and team members needed the assurance that they could freely express themselves. These findings indicate that team members needed to take accountability towards actively looking for opportunities to build trust. This implies that those who did not actively seek such opportunities to build trust may be perceived as unaccountable and opposing the achievement of team goals. This also means that every team member was charged with the accountability to create a safe environment for all team members to interact and share inputs. In order to create this safe environment, participants added that team members needed to foster one-on-one intimate relationships with each other. This was important as Gilson et al. (2015) pointed out that the lack of interpersonal trust resulted in team members not sharing their knowledge with other team members, which would hamper collaboration and team performance. Therefore, it follows that in the absence of trust, communication, collaboration, team cohesion and performance may be negatively impacted.

The findings also indicated that diversity within virtual teams as well as different leaderships styles often resulted in a challenge with reaching consensus. This was consistent with scholars who agreed that reaching consensus in virtual project teams can be a challenge (Peng et al., 2019). Participants D1 and D13 confirmed that reaching consensus was often a challenge. To enhance the opportunities for reaching consensus, Participants D1 and D6 argued that it was important to establish buy-in, a mutual understanding upfront and to lean on democratic principles. Participant D15 added that sharing a common vision was one of the key elements towards reaching consensus. This was in line with Lechner and Mortlock (2021) who argued that sharing a common goal was critical for virtual project teams. From the findings, it is evident that virtual team members need to be intentional about reaching consensus, they need to share a common goal, establish principles that guide the process of reaching consensus and have a leadership style that understands and supports the process of reaching consensus.

Participants also elaborated on the emergent need for coaching and mentoring. This included instances where external assistance was needed and where members coached each other offline. According to the participants, this needed team members to be open minded to learn and to be influenced. Coaching and mentoring was not within the scope of this research, however, the findings suggest that there is merit in exploring this phenomenon, as evidence is shown that it emerges in virtual project teams. According to Participant D6, evidence of coaching and mentoring was when team members took time to teach each other and exchanged tips on building ICT skills.

According to the participants, empathy was one of the behaviours that demonstrated leadership within virtual project teams. This was in line with Quisenberry (2018), who argued that empathy was highly regarded as a key attribute of leadership and ultimately helped steer projects along. In agreement with these sentiments, Participants D8 and D14 explained that empathy improved communication and collaboration, which in turn improved team collaboration and performance. Participants D3 and D5 gave practical examples where they were empathetic to one another, wherein if a meeting was scheduled to be on MS Teams, and it happened that one member could not use the platform, the team would swiftly change to another platform in order to accommodate all team members.

6.7. Conclusion to Research Question 3

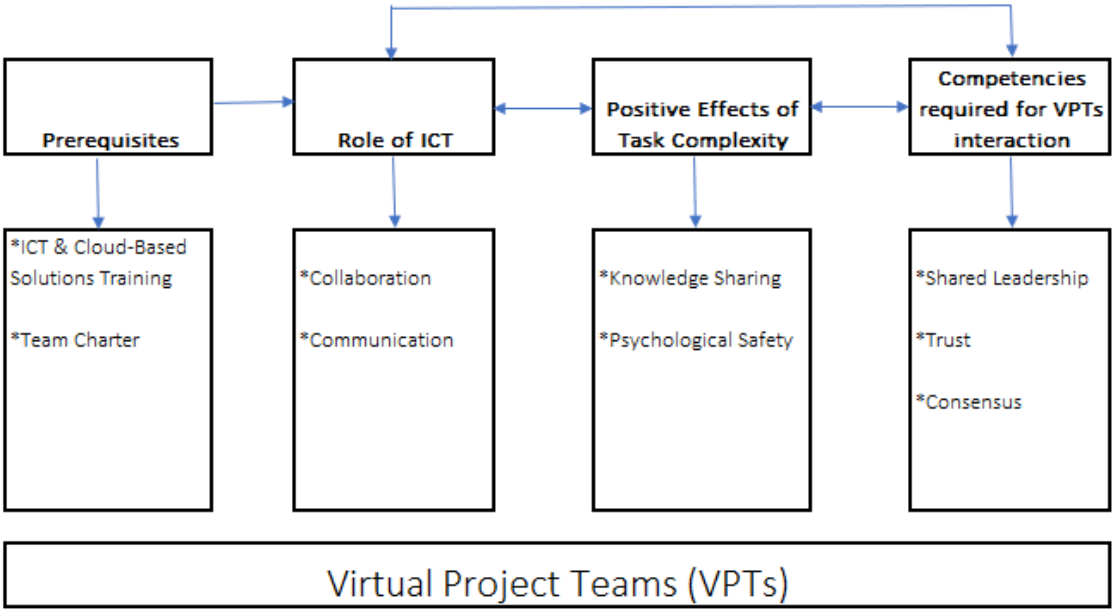
Looking at the evidence presented above, this research concludes that the sharing of leadership positively supports virtual teams when dealing with complex tasks. This support comes in the form of leadership styles such as participative, situational as well as shared leadership. Shared leadership supports virtual teams in dealing with complex tasks by creating an environment where pressure is reduced across team members and excitement to achieve is created. Shared leadership also creates an environment that supports coaching and mentoring, builds trust, establishes principles to reach consensus as well as creating empathy among team members. In this environment, team members lean on those with expertise within the team to take the lead on complex tasks, while other members reach out to seek expert advice from external environments. These behaviours enable the team to tackle complex tasks with confidence and create the belief and excitement to achieve.

6.8. Conclusion

This chapter discussed the result of the study as presented in Chapter 5 and in line with the lived experiences of the participants. The results were grouped into themes and discussed under the research questions presented in Chapter 3 and these discussions aligned with the literature reviewed presented in Chapter 2. Although Dulebohn and Hoch's (2017) IPO framework gives an overview of inputs, team processes and emergent states as well as outcomes to be considered, the findings of this research have revealed specific relationships between key factors that need to be carefully considered in terms of understanding task complexity and shared leadership in virtual project teams. These factors are captured in a proposed conceptual model as shown in Figure 4.

As depicted in the conceptual model in Figure 4 below and in line with the findings, this research proposes that there are key foundational elements that need careful consideration towards the formation and evolution of virtual project teams. Learning from the lived experiences of the participants of this study, this research proposes one of the key foundational elements to virtual project teams are the 'Prerequisites'. These include training on ICT and cloud-based solutions as well as the formation of a team charter. As pointed out by the participants, there were experiences where a lack of ICT skills that related to virtual project team tools led to delays and derailment of projects. It is therefore important when formulating optimal virtual project teams, careful consideration be made in terms of providing upfront training to ensure that the team has adequate ICT skills necessary for the virtual environment (Dulebohn & Hoch, 2017).

Figure 4: Foundational elements required for optimal team performance and outcomes in virtual project teams



Source: Author

In addition to the requirement for upfront ICT training, this conceptual model proposes the formation of a team charter as part of the prerequisites. This charter would assist in creating psychologically safe spaces for team members to freely and openly express themselves. The team charter will also aid in providing principles for reaching team consensus as well as how to deal with conflict (Turesky et al., 2020).

The conceptual model then proposes that the prerequisites have a positive influence on the role of ICT, specifically on team communication and collaboration. In turn, the role of ICT has a bi-directional positive influence on positive effects of task complexity such as knowledge sharing and psychological safety. The positive effects of tasks complexity have a bi-directional positive influence on competencies such as shared leadership, trust and consensus, which are required in virtual project teams interactions. These competencies also have a bi-directional positive influence on the role of ICT within virtual project teams.

7. Chapter 7: Conclusions and Recommendations

7.1. Introduction

This chapter presents a summary of the key findings aligned with each research question. The chapter also tables theoretical contribution, implications for management and other stakeholder as well as recommendations for future research and limitations of the study.

7.2. Principal conclusions

7.2.1. Summary for Research Question 1: How does technology play a role in the development of virtual project teams?

The popularity of virtual teams is expected to continue rising as a result of rapid technological advances (Eisenberg et al., 2016). In a world where pandemics such as Covid-19 restrict human gatherings, business needs to adopt new operating models, with technology enabling business operations as well as forming an integral part in business to ensure business continuity and sustainability (Dulebohn et al., 2017; Eisenberg et al., 2016; Liao, 2017; Waizenegger et al., 2020; Zhu & Lee, 2017). Orhan et al. (2016) pointed out that ICT has the potential to affect virtual team performance positively by improving communication and collaboration across space and time.

Against this backdrop, communication technology is an essential part of virtual project teams as it enables information/knowledge-sharing, problem-solving as well as collaboration (Laitinen & Valo, 2018). This study has found that technology has indeed played a positive role within virtual project teams wherein it enabled communication and collaboration while allowing for flexibility as well as bridging the digital divide. The participants explained how they were able to communicate with each other almost at any time and were able to use cloud-based solutions to collaborate on the same projects at the same time, without overriding each other's work.

On the other hand, ICT has the potential to affect virtual team performance negatively and impose communication and collaboration difficulties (Dulebohn & Hoch, 2017). Some of the challenges are brought about by the absence of non-verbal cues such as facial expressions, hand movements as well as tone of voice (Popescu & Warmenhoven, 2019). Others are as a result of technological infrastructure as well

as differing technological skills and literacy levels among team members (Hadjiev, 2018). This study has found that power disruptions through load-shedding and inconsistencies in access to bandwidth that are brought about by unique South African experiences, negatively impacted on virtual project teams as this resulted in a breakdown of communication and trust. The study also found that the absence of face-to-face interactions resulted in the loss of intimacy among virtual project team members.

7.2.2. Summary for Research Question 2: How does task complexity affect working in a virtual project team?

Virtual project teams can assist in reducing challenges associated with complex tasks as a result of time available to digest information and ideas (Eisenberg et al., 2016). Choi and Cho (2019) confirmed that virtual teams performing complex tasks exhibit greater trust, cooperation, coordination and knowledge sharing than teams performing simple tasks. This is because complex tasks require greater coordination, greater communication and increased shared leadership to facilitate knowledge sharing and influence team engagement for synchronous communication and this in turn establishes trust between team members (Hoch & Kozlowski, 2014).

This study found that where virtual project teams were faced with complex tasks, there was greater information/knowledge sharing and team members created psychologically safe spaces where everyone could freely and openly express themselves as well as solicit outside expert advice (Rosen et al., 2007). This in turn positively influenced trust and collaboration within virtual project teams, ultimately leading to improved performance (Alsharo et al., 2017).

On the other hand, complex tasks brought about challenges associated with confirmation bias as well as conflict. Confirmation bias had a negative effect on team performance where individuals, who believed they were subject matter experts, made decisions without consulting the team (Gatlin et al., 2017). Conflict also affected team performance negatively where there was a mismatch among team members on expectations and motivation (Sasikala et al., 2021). Participants agreed that having different expectations, in terms of the required effort needed to perform a task, had caused conflict among team members.

7.2.3. Summary for Research Question 3: How does the sharing of leadership across team members support task complexity in a virtual project team?

This study found that situational, participative and shared leadership emerged within virtual project teams and positively influenced successful completion of complex tasks (Carson et al., 2007; Scott-Young et al., 2019). Virtual project team members organised their team capabilities by leaning on their individual strengths in order to tackle complex tasks (Cao et al., 2012). This was also supported by team members' conscious efforts to build trust, create psychologically safe spaces, encourage coaching and mentoring amongst each other, be empathetic as well as and endeavour to reach consensus. These conscious efforts helped to foster innovation when tackling complex tasks and also helped to improve team cohesion as well as common understanding (Hoch, 2013).

7.3. Theoretical contribution

This study makes theoretical contribution in two ways. Firstly, the study contributes to a gap in the literature on the role of technology in virtual project teams (Morrison-Smith & Ruiz, 2020). The study has pointed out the explicit role played by technology within virtual project team as well as challenges and recommendations on how to mitigate these. Secondly, the study contributes to the virtual project teams' discipline by developing the conceptual framework of foundational elements required in the formation of virtual project teams as depicted in Figure 4.

7.4. Implications for management and other relevant stakeholders

This study has revealed that virtual team members communicate with each other almost 24/7, doing away with traditional 9 to 5 working hours. Management should be aware that when putting together virtual teams, different working policies such as that of working hours may need to be amended as these teams are driven by outputs and not the number of hours worked. Similarly, management needs to make plans to be available almost 24/7 to these teams so as to offer any support they may require. This also has implications on legislation that governs basic conditions of employment. The implications include the regulations around prescribed number of hours that need to be worked as well as the prescribed breaks. This also brings about questions around other legislative requirements typically required from employers, such as compliance to occupational health and safety – when virtual team members

work from their homes, whose responsibility is it to ensure compliance to such legislation?

The unique experiences of load-shedding mean that management and relevant stakeholders may need to put in extra effort in providing power back-up systems as well as improved connectivity. There will need to be contingency plans in place to avoid loss of work during power failures. Equally important, is the need for ICT skills training. Management needs to be aware that although some employees may be top engineers for example, they may not necessarily be well versed with the required ICT skills to participate in virtual project teams seamlessly. To this end, it may be necessary to offer basic training on the use of ICT tools as part of forming virtual project teams as depicted in Figure 4.

This paper further recommends the formation of a team charter upfront, wherein team direction is clarified while establishing boundaries (see Figure 4 above). This will help in reducing conflict and improving consensus and trust amongst team members. In addition, the team charter can also be used as a tool to foster psychological safety amongst team members. Managers need to be intentional about improving psychological safety through activities such as routine social check-ins at the beginning of each meeting.

7.5. Limitations of the research

The exploratory nature of this qualitative study identified the below limitations of the research:

- Potential researcher bias which may have influenced the literature review, interview process, analysis, findings and conclusions of the study (Yin, 2003). Therefore, caution must be taken when interpreting the data. However, the advantage was that the researcher possessed similar experience as a result of working in a similar environment and therefore could prevent subject bias.
- The selected small purposive sample was also not representative of the entire population and cannot be generalised as such (Saunders & Lewis, 2018).
- The cross-sectional nature of this study limited the scope of the researcher's ability to measure changes over time, particularly in the context of the dynamic and emergent state processes that were present in virtual teams
- Interesting insights around flexibility as a result of ICT as well as situational and participative leadership within these teams emerged. However, these

constructs were outside the scope of this research and as such, were not explored further.

7.6. Suggestions for future research

This study proposes further research on the concept of 'flexibility' within virtual project teams. While this research revealed that participants enjoyed the freedom to move meetings around, miss meetings and rely on recordings or use different platforms, this research did not delve into the impact of this flexibility on team outcomes. Therefore, it may be useful to delve deeper into what flexibility means and how it impacts on team outcomes as well as how it can be managed. Future research is also proposed in understanding the effects of situational leadership and participative leadership on complex tasks performed in virtual project teams. This study also proposes for the conceptual model presented in Figure 4 to be tested in order to ascertain the potential value it may add both in theory and practice.

7.7. Conclusion

The accelerated growth in the use of virtual teams has led to a radical shift in virtual collaboration though technology for the efficient delivery of complex tasks through virtual project teams. This study aimed to understand the requirements that team members needed in order to facilitate their optimised performance, leading to improved team outcomes in the context of virtual project teams when performing complex tasks. This also included a better understanding into the critical role that technology played in the development of these teams.

This study found that technology was indeed an enabler of improved communication and collaboration amongst team members and also bridged the digital divide. In addition to this, the study also found that task complexity encouraged knowledge sharing while assisting in creating a psychologically safe environment for virtual team members which led to improved productivity. Moreover, the study identified that shared leadership supported virtual project teams when dealing with complex tasks and this enabled the team to work with confidence while creating a positive team environment that combined their efforts to achieve common goals.

In pursuit of understanding this phenomenon, the participants assisted the researcher to create a conceptual model that consisted of the competencies required to create a virtual project team that can ultimately produce effective team outcomes. Understanding the interdependencies in virtual project teams presents opportunities

for businesses and management to formulate optimal self-managed teams that are necessary to perform complex tasks successfully in this digital era where business is conducted beyond physical boundaries.

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Appendix 1: Interview Guide

Dear Participant,

I would like to thank you for confirming your participation in this online interview with me via Microsoft Teams. I really appreciate your time, effort and contribution towards making this research a success. Before I continue, I would like to reiterate that this interview is voluntary, and you are welcome to withdraw at any time without any penalty. Your responses to the questions will be recorded and utilised only for the purpose of this research, they will be kept confidential and reported without any identifiers.

The title of my research is “Understanding task complexity and shared leadership in virtual project teams.”

The aim of this research is to gain an understanding of:

- Technology and its role in the development of virtual project teams
- Complex tasks and their effects on virtual project teams
- How this ability of the sharing of leadership across team members supports complex tasks in virtual project teams

The insights gained will provide a better understanding of what team members require in order to perform complex tasks in a virtual project teams context with the intention of managing and equipping these teams to be more production, effective and perform better ultimately leading to improved team outcomes.

I encourage you to please speak openly and be assured that the information you share in this interview will remain confidential and will be anonymised to protect your information. Before we commence the interview, may you please confirm that you have signed and emailed the consent form? Please also confirm that you are comfortable for me to record the interview on both MS Teams and an audio recording device?

The first 3 Questions relate to Technology in Virtual Project Teams:

1. How has technology supported you in connecting, interacting and building relationships with your team members?
2. What technical skills do you consider critical to effectively working in virtual project teams?
3. What technological or skills challenges did you experience working in virtual project teams?

The next 4 questions relate to Task Complexity in Virtual Project Teams:

4. What has helped you, as a team member, to manage complex tasks in a virtual project team?
5. How did working virtually in a cross-functional team affect the coordination of work?
6. What mechanisms were put in place to ensure understanding and alignment of project goals amongst all team members?

The last 4 Questions relate to Shared Leadership in virtual project teams:

7. In your opinion, which leadership style was predominant in your team and why?
8. Which behaviours or traits from the leadership style you described support complex tasks the most?
9. How did the leadership style you described influence decision making in the team?
10. What else contributed to the successful completion of complex tasks in your virtual project team?

I would like to thank you very much for participation, it is really appreciated, and I wish you a good day further. If you have no further questions, I will end this meeting.

Appendix 2: Ethical Clearance Approval

Gordon Institute of Business Science
University of Pretoria

GIBS Uma <22258486@mygibs.co.za>

Ethical Clearance Approved
1 message

Masters Research <MastersResearch@gibs.co.za> 16 July 2021 at 15:43
To: "22258486@mygibs.co.za" <22258486@mygibs.co.za>
Cc: Masters Research <MastersResearch@gibs.co.za>

Gordon Institute of Business Science
University of Pretoria

Ethical Clearance Approved

Dear Uma Nadimpalli,

Please be advised that your application for Ethical Clearance has been approved.
You are therefore allowed to continue collecting your data.
We wish you everything of the best for the rest of the project.

Ethical Clearance Form

Kind Regards

Masters Research

Gordon Institute of Business Science, University of Pretoria

Main Tel: +27 11 771 4000
Direct Tel:

Email: mastersresearch@gibs.co.za
Web: www.gibs.co.za.
Physical Address: 26 Melville Road, Illovo, Johannesburg

Appendix 3: Atlas.ti Code Book

Code	Groundedness	Groups
Advantages of ICT facilitation_enables individuals to work in isolation and then share input for consolidation	27	Advantages of ICT facilitation
Advantages of ICT facilitation_creates flexibility for attendees to participate at different times to overcome constraints	24	Advantages of ICT facilitation
Advantages of ICT facilitation_creates flexibility in formats of attendance for meetings	20	Advantages of ICT facilitation
Advantages of ICT facilitation_connectivity via the internet helps link people and processes	19	Advantages of ICT facilitation
Advantages of ICT facilitation_has flexibility to accommodate both formal and informal interaction	15	Advantages of ICT facilitation
Advantages of ICT facilitation_enables multiple individuals to collaborate and complete work simulatenously	13	Advantages of ICT facilitation
Advantages of ICT facilitation_effective for gathering and consolidating information	10	Advantages of ICT facilitation
Advantages of ICT facilitation_increased frequency of communication improves quality of approach	10	Advantages of ICT facilitation
Advantages of ICT facilitation_mitigates impact of unexpected disruptions to operational continuity e.g. covid	10	Advantages of ICT facilitation
Advantages of ICT facilitation_helpful in tracking progress across team members	9	Advantages of ICT facilitation
Advantages of ICT facilitation_requires conscious establishment of trust and accountability	9	Advantages of ICT facilitation
Advantages of ICT facilitated interaction_percieved to facilitate greater depth of learning than F2F interactions	8	Advantages of ICT facilitation
Advantages of ICT facilitation_can help establish and maintain longterm relationships and networks	8	Advantages of ICT facilitation
Advantages of ICT facilitation_central to the successful completion of shared tasks	8	Advantages of ICT facilitation
Advantages of ICT facilitation_creates scope to balance work and life demands more effectively	8	Advantages of ICT facilitation
Advantages of ICT facilitation_ease of document sharing	8	Advantages of ICT facilitation
Advantages of ICT facilitation_wide diversity of tools and platforms enable contingency options for connectivity	8	Advantages of ICT facilitation
Opportunities created by ICT interactions_team members can step up and lead helpful administrative actions	8	Advantages of ICT facilitation

Code	Groundedness	Groups
Advantages of ICT facilitation_overcomes geographical distances separating partcipants that must interact	7	Advantages of ICT facilitation
Advantages of ICT facilitation_supports collaboration	7	Advantages of ICT facilitation
Advantages of ICT facilitation_can be a tool for building trust	6	Advantages of ICT facilitation
Advantages of ICT facilitation_information sharing can be an effective alternative to verbal debate	6	Advantages of ICT facilitation
Advantages of ICT facilitation_assist in breaking down complex tasks	5	Advantages of ICT facilitation
Advantages of ICT facilitation_enable recording of meetings for repeat viewing	5	Advantages of ICT facilitation
Advantages of ICT facilitation_enabled users to be better researchers and access information easily	5	Advantages of ICT facilitation
Advantages of VT interactions_convenient alternative for interaction when physical proximity is constrained	5	Advantages of ICT facilitation
Advantages of ICT facilitated interaction_achieving relaxed and friendly tone of interaction can be guided by choice of platform	4	Advantages of ICT facilitation
Advantages of ICT facilitated interaction_source of great power to drive progress	4	Advantages of ICT facilitation
Advantages of ICT facilitation_has flexibility to accommodate timeout interventions to calm heated debate	4	Advantages of ICT facilitation
Advantages of ICT facilitation_serves as a bridge to link team members across platforms and topics	4	Advantages of ICT facilitation
Advantages of ICT facilitation_time saving	4	Advantages of ICT facilitation
Advantages of ICT facilitation_tool for reducing barriers to communication	4	Advantages of ICT facilitation
Advantages of ICT facilitation_meeting notes are easily accessible for multiple viewing	3	Advantages of ICT facilitation
Advantages of ICT facilitation_tools and platforms are easy to operate	3	Advantages of ICT facilitation
A view that F2F interactions drives pretentiousness whilst online fosters more groundedness	2	Advantages of ICT facilitation
Advantages of ICT facilitated interaction_lowers cost of communication making it affordable	2	Advantages of ICT facilitation
Advantages of ICT facilitation_multiple platforms that can be used by different teams	2	Advantages of ICT facilitation
Advantages of ICT facilitation_removes physical barriers to meeting such as concern for safety of attendees	2	Advantages of ICT facilitation
Advantages of ICT platforms_can be effective at revealing individual personalities	1	Advantages of ICT facilitation

Code	Groundedness	Groups
Approach for effective VT collaboration_employ multiple ICT platforms to support processes	23	Approach for effective VT collaboration
Approach for effective VT collaboration_establish consensus for actions and direction	23	Approach for effective VT collaboration
Approach for effective VT collaboration_preplanning guides follow up task identification and allocation for execution	19	Approach for effective VT collaboration
Approach for effective VT collaboration_create an environment where members feel safe to interact and share	17	Approach for effective VT collaboration
Approach for effective VT collaboration_ability to manage time effectively	15	Approach for effective VT collaboration
Approach for effective VT collaboration_assign an appropriate project lead per project	15	Approach for effective VT collaboration
Approach for effective VT collaboration_give feedback to coach members to show up stronger	15	Approach for effective VT collaboration
Approach for effective VT collaboration_ability to establish and follow a set structure to tackle a task	14	Approach for effective VT collaboration
Approach for effective VT collaboration_develop mechanisms to adjudicate contentious issues	13	Approach for effective VT collaboration
Approach for effective VT collaboration_invest time to deliberately nurture a sense of familiarity and ease interactions	13	Approach for effective VT collaboration
Approach for effective VT collaboration_maturity to be vulnerable to other group members breaks barriers	13	Approach for effective VT collaboration
Approach for effective VT collaboration_develop mechanisms to rotate leadership of tasks and processes	12	Approach for effective VT collaboration
Approach for effective VT collaboration_foster one on one intimacy among team members	12	Approach for effective VT collaboration
Approach for effective VT collaboration_maturity to extend optimal effort for completion of tasks	12	Approach for effective VT collaboration
Approach for effective VT collaboration_members need to take initiative to interact informally amongst themselves to drive progress of individual tasks	12	Approach for effective VT collaboration
Approach for effective VT collaboration_preplanning guides productivity in discussions	12	Approach for effective VT collaboration

Code	Groundedness	Groups
Approach for effective VT collaboration_maturity to take responsibility for how your behaviours come across	10	Approach for effective VT collaboration
Approach for effective VT collaboration_preplanning useful when tackling complicated tasks	10	Approach for effective VT collaboration
Approach for effective VT collaboration_discuss and agree preferred technology platforms to employ	9	Approach for effective VT collaboration
Approach for effective VT collaboration_recognising mutual dependency for successful completion of goals	9	Approach for effective VT collaboration
Approach for effective VT collaboration_transfer of leardership control among members as situations arise	9	Approach for effective VT collaboration
Approach for effective VT collaboration_an attitude of commitment and willingness to go the extra mile	8	Approach for effective VT collaboration
Approach for effective VT collaboration_encouraging each other to grow in competency	8	Approach for effective VT collaboration
Approach for effective VT collaboration_shared ownership and accountability for key decisions made	8	Approach for effective VT collaboration
Approach for effective VT collaboration_assign specific roles to each team member	7	Approach for effective VT collaboration
Approach for effective VT collaboration_invest time to build social connectivity through humour and other topical information	7	Approach for effective VT collaboration
Approach for effective VT collaboration_leaders must moderate team interactions for optimal outcomes	7	Approach for effective VT collaboration
Approach for effective VT collaboration_start by setting up a social interaction grouping on social media platform	7	Approach for effective VT collaboration
Positive effects of VT interactions_absence of physical proximity creates room for reflection and improved contributions	7	Approach for effective VT collaboration
Approach for effective VT collaboration_conscious ettiquette required for online interaction	6	Approach for effective VT collaboration
Approach for effective VT collaboration_establish a shared vision	6	Approach for effective VT collaboration
Approach for effective VT collaboration_establish a team charter	6	Approach for effective VT collaboration

Code	Groundedness	Groups
Approach for effective VT collaboration_shifting responsibility to align with specialist skills required.	6	Approach for effective VT collaboration
Approach for effective VT collaboration_assign 2 to 3 people to jointly leader a project	5	Approach for effective VT collaboration
Approach for effective VT collaboration_clarify role of project lead	5	Approach for effective VT collaboration
Approach for effective VT collaboration_trial and error required to identify suitable processes to drive work	5	Approach for effective VT collaboration
Approach for effective VT collaboration_assign a leader to drive each meeting	4	Approach for effective VT collaboration
Approach for effective VT collaboration_diligent prior preparation for meetings	4	Approach for effective VT collaboration
Approach for effective VT collaboration_encouraging people that get along to work together can enhance pace and quality of output	4	Approach for effective VT collaboration
Positive effects of VTs_team help verify and build knowledge	4	Approach for effective VT collaboration
Approach for effective VT collaboration_creating required space to onboard team members into a shared view	3	Approach for effective VT collaboration
Approach for effective VT collaboration_identify a member to help sense check and feedback on personal effect	3	Approach for effective VT collaboration
Approach for effective VT collaboration_leaders must moderate team interactions for optimal inclusiveness	3	Approach for effective VT collaboration
Approach for effective VT collaboration_requires innovative thought to develop tools to enhance communication efforts	3	Approach for effective VT collaboration
Approach for effective VT collaboration_set operational guidelines that can be replicated across meetings	3	Approach for effective VT collaboration
Approach for effective VT collaboration_start by setting up a social interaction grouping to interact over shared interests	3	Approach for effective VT collaboration
Approach for effective VT collaboration_anticipating interaction risks and challenges becomes easier as members more familiar	2	Approach for effective VT collaboration

Code	Groundedness	Groups
Approach for effective VT collaboration_create opportunity for individual views to be heard	2	Approach for effective VT collaboration
Approach for effective VT collaboration_develop mechanisms to drive members to improve contributions	2	Approach for effective VT collaboration
Approach for effective VT collaboration_limiting verbal debate interactions can optimise outputs	2	Approach for effective VT collaboration
Approach for effective VT collaboration_set up a formal meeting environment	2	Approach for effective VT collaboration
Approach for effective VT collaboration_train team members to build ICT skills	2	Approach for effective VT collaboration
Positive effects of VT interactions_nurtured a deepened consciousness to the complexity of human conditions	2	Approach for effective VT collaboration
Approach for effective VT collaboration_assist individuals to nurture self-discipline	1	Approach for effective VT collaboration
Approach for effective VT collaboration_candid confessions of lived truths	1	Approach for effective VT collaboration
Approach for effective VT collaboration_coaching support to guide team establishment	1	Approach for effective VT collaboration
Approach for effective VT collaboration_individuals need strong communication skills	1	Approach for effective VT collaboration
Approach for effective VT collaboration_leverage pool of ICT skills within the team to operate multiple platforms	1	Approach for effective VT collaboration
Approach for effective VT collaboration_stimulate debate over topical social issues	1	Approach for effective VT collaboration
Approach for effective VT collaboration_trial and error required to identify a suitable sense checking partner in a group	1	Approach for effective VT collaboration
Character of participative interaction_when team members voluntarily extend best effort to complete tasks	18	Building trust and relationships in VT interaction
Approach to building rapport for online comms_empathy towards participant preferences and challenges with technology tools	13	Building trust and relationships in VT interaction
Approach to building trust for onlline _sharing of tangible work outputs builds trust	13	Building trust and relationships in VT interaction

Code	Groundedness	Groups
Trust building effects_tangible proof points clarify levels of expectations from individuals	11	Building trust and relationships in VT interaction
Approach to building trust for onlline comms_verbalise sentiments to invite openness	10	Building trust and relationships in VT interaction
Trust building effects_multifacted contributions, characteristics and conditions contribute to development of trust	8	Building trust and relationships in VT interaction
Trust building effects_as a phenomenon trust remains an interpersonal thing	6	Building trust and relationships in VT interaction
Approach to building trust for onlline _communication is essential for building trust	4	Building trust and relationships in VT interaction
Approach to building trust for onlline collaboration_dig deeper to surface emotions	3	Building trust and relationships in VT interaction
Negative effects of complex tasks_trust founded on demonstrated competency	4	Building trust and relationships in VT interaction, Character of complex tasks
Challenges encounted by virtual teams_loss of physical human interactions that serve to build connectivity	24	Challenges faced by virtual teams
Challenges encounted by virtual teams_different motivations drive effort levels	18	Challenges faced by virtual teams
Challenges encounted by virtual teams_power supply disruptions negatively affect connectivity	17	Challenges faced by virtual teams
Challenges encounted by virtual teams_uncertainty of relying on technology as it can fail	16	Challenges faced by virtual teams
Challenges encounted by virtual teams_it takes time to debate and frame consensus	15	Challenges faced by virtual teams
Challenges encounted by virtual teams_moderating conflict during team interactions	15	Challenges faced by virtual teams
Challenges encounted by virtual teams_inconsistencies in access to bandwidth hamper quality collaborative interaction	14	Challenges faced by virtual teams
Challenges encounted by virtual teams_balancing delivery time pressures in face of divergent views	13	Challenges faced by virtual teams
Challenges encounted by virtual teams_moderating personality types	13	Challenges faced by virtual teams
Challenges encounted by virtual teams_balancing delivery time pressures with life challenges that arise	12	Challenges faced by virtual teams

Code	Groundedness	Groups
Challenges encounted by virtual teams_different competency levels in employ of ICT infrastructure	12	Challenges faced by virtual teams
Challenges encounted by virtual teams_formation of silos or cliques	12	Challenges faced by virtual teams
Challenges encounted by virtual teams_being too democratic in decisioning can sometimes lead to ineffective solutions	9	Challenges faced by virtual teams
Challenges encounted by virtual teams_difficult to establish rapport	9	Challenges faced by virtual teams
Challenges encounted by virtual teams_it takes time for individuals to develop ICT skills	9	Challenges faced by virtual teams
Challenges encounted by virtual teams_navigating different preferences towards terchnology	9	Challenges faced by virtual teams
Challenges encounted by virtual teams_loss of physical human interaction makes it difficult to guage responses	8	Challenges faced by virtual teams
Challenges encounted by virtual teams_navigating diverse backgrounds	8	Challenges faced by virtual teams
Challenges encounted by virtual teams_collaborating across different operating systems	7	Challenges faced by virtual teams
Challenges encounted by virtual teams_dealing with ill prepared team members	6	Challenges faced by virtual teams
Challenges encounted by virtual teams_difficult to establish physical contact when cameras not used	6	Challenges faced by virtual teams
Challenges encounted by virtual teams_heavy reliance on individuals with stronger ICT skill	6	Challenges faced by virtual teams
Challenges encounted by virtual teams_managing conflicting personalities	6	Challenges faced by virtual teams
Challenges encounted by virtual teams_navigating differences in work ethic	6	Challenges faced by virtual teams
Challenges encounted by virtual teams_balancing delivery time pressures and staying motivated	5	Challenges faced by virtual teams
Challenges encounted by virtual teams_risk of one individual carrying the load for the team	5	Challenges faced by virtual teams
Challenges encounted by virtual teams_sometimes difficult to moderate individual biases	5	Challenges faced by virtual teams
Challenges encounted by virtual teams_dissonance when outcomes do not meet expectations	4	Challenges faced by virtual teams
Challenges encounted by virtual teams_lack of clarity on what skills are required for proficient employ of ICT tools	4	Challenges faced by virtual teams
Challenges encounted by virtual teams_loss of access to physical tools used to facilitate discussion	4	Challenges faced by virtual teams

Code	Groundedness	Groups
Challenges encounted with complex tasks_can drive transactional behaviours	4	Challenges faced by virtual teams
Challenges encounted by virtual study teams_navigating different organisational security firewall constraints	2	Challenges faced by virtual teams
Challenges encounted by virtual teams_most users have limited depth of technical insight to optimise ICT platforms	2	Challenges faced by virtual teams
Challenges encounted by virtual teams_quest for harmony can reduce efficiency	2	Challenges faced by virtual teams
Challenges encounted by virtual teams_strained interaction	2	Challenges faced by virtual teams
Challenges encounted by virtual teams_delivery time pressures can disrupt planning and structuring critical for effective task completion	1	Challenges faced by virtual teams
Challenges encounted by virtual teams_differences in dealing with conflict	1	Challenges faced by virtual teams
Challenges encounted by virtual teams_flexible meeting attendance compromises active engagment	1	Challenges faced by virtual teams
Challenges encounted by virtual teams_moderating interactions during team meetings	1	Challenges faced by virtual teams
Challenges encounted by virtual teams_must be flexible to employ different platforms to align with target stakeholder preferences	1	Challenges faced by virtual teams
Challenges encounted by virtual teams_tasks deemed too complex can disarm collaboration efforts	1	Challenges faced by virtual teams
Challenges encountered by virtual teams_no face-to-face interaction	1	Challenges faced by virtual teams
Outcomes of poor VT interactions_project failure	1	Challenges faced by virtual teams
Challenges encounted by virtual teams_navigating cumbersome aspects of ICT can frustrate discussion flow	10	Challenges faced by virtual teams, Challenges with ICT when collaborating
Challenges encounted by virtual teams_poor quality network infrastructure disrupts communication	5	Challenges faced by virtual teams, Challenges with ICT when collaborating
Challenges of ICT for collaborations_flexibility of accessing ICT can be abused at expense of professional conduct	12	Challenges with ICT when collaborating
Challenges with ICT comms_speed of implementation has led to expectation that everyone is proficient with ICT tools and platforms	9	Challenges with ICT when collaborating

Code	Groundedness	Groups
Challenges of ICT for comms_not a catalyst for trust building	8	Challenges with ICT when collaborating
Challenges with effectiuve employ of ICT tools_lack of access to any formal training support	7	Challenges with ICT when collaborating
Challenges of ICT for collaborations_takes time to build trust	5	Challenges with ICT when collaborating
Challenges of ICT for collaborations_lack of physical connectivity creates a sense of superficial unreal interaction	4	Challenges with ICT when collaborating
Challenges of ICT for collaborations_lack of visual connectivity when videos not used exaggerates loss of intimacy	3	Challenges with ICT when collaborating
Challenges with ICT comms_ technology mechanics can distort messages	3	Challenges with ICT when collaborating
Challenges with ICT comms_ technology mechanics can exaggerate normal human challenges with interpersonal relations	3	Challenges with ICT when collaborating
Challenges with ICT comms_ technology mechanics can fail	3	Challenges with ICT when collaborating
Challenges with ICT comms_ technology mechanics tend to drive transactional interaction	3	Challenges with ICT when collaborating
Challenges of ICT for _ICT tools can be positioned as an excuse for non delivery of set tasks	2	Challenges with ICT when collaborating
Challenges of ICT for collaborations_lack of physical connectivity results in loss of consistency in member participation	2	Challenges with ICT when collaborating
Challenges of ICT for collaborations_difficult to harmonise document formatting	1	Challenges with ICT when collaborating
Character of complex tasks_require additional research to close knowledge gaps	24	Character of complex tasks
Character of complex tasks_require combine of a diverse grouping of knowledge workers	18	Character of complex tasks
Character of complex tasks_require structured approach to digest and plan approach	13	Character of complex tasks
Character of complex tasks_require collaboration for completion	8	Character of complex tasks
Character of complex tasks_require greater effort for completion	8	Character of complex tasks
Character of complex tasks_team generally has limited prior knowledge on the task requirements	8	Character of complex tasks

Code	Groundedness	Groups
Positive effects of complex tasks_creates positive climate of shared dependency to build understanding	8	Character of complex tasks
Character of complex tasks_require greater ICT skill best attained through special training	4	Character of complex tasks
Positive effects of complex tasks_not clouded by inherent biases of views within the team	3	Character of complex tasks
Character of complex tasks_impacted by high pace of change	2	Character of complex tasks
Character of complex tasks_require transformational leadership for optimal outcomes	2	Character of complex tasks
Negative effects of complex tasks_limited room to accommodate learning and mistakes	1	Character of complex tasks
Types of complex tasks experienced_acquisitions	1	Character of complex tasks
Characteristics of knowledge teams_expect individuals to take full ownership of leading area of expertise	27	Characteristics of knowledge teams
Characteristics of knowledge teams_interaction cannot be hierarchical	22	Characteristics of knowledge teams
Challenges encounted by knowledge teams_different effort level expectations can cause frustration.	18	Characteristics of knowledge teams
Challenges encounted by knowledge teams in virtual spaces_balancing an overlap of pressures consisting of interpersonal relations, delivery timing, task complexity and technology competencies	17	Characteristics of knowledge teams
Positive effects of knowledge team interactions_create a bridge to access to expert networks for advice	11	Characteristics of knowledge teams
Characteristics of knowledge teams_experiences of effect are moderated by personality types	8	Characteristics of knowledge teams
Positive effects of knowledge team interactions_set standards of delivery for each other constantly raising the bar	8	Characteristics of knowledge teams
Characteristics of knowledge teams_expect high level of delivery from self	7	Characteristics of knowledge teams
Characteristics of knowledge teams_expect individuals to be competently skilled in their area of specialisation	7	Characteristics of knowledge teams
Characteristics of knowledge teams_share specialist knowledge to onboard others to align with technical views	7	Characteristics of knowledge teams
Characteristics of knowledge teams_decision making leadership must be shared guided by subject matter in focus	4	Characteristics of knowledge teams
Characteristics of knowledge teams_must have a shared vision	4	Characteristics of knowledge teams

Code	Groundedness	Groups
Challenges encounted by knowledge teams_not always ready to slow down and accommodating different levels of understanding within the team	3	Characteristics of knowledge teams
Characteristics of knowledge teams_expect high level of commitment by members	2	Characteristics of knowledge teams
Characteristics of knowledge teams_must feel equitably treated	2	Characteristics of knowledge teams
Characteristics of knowledge teams_often liberated from making decsions by working to provide options towards a decision marker	2	Characteristics of knowledge teams
Roles of project lead for a knowledge team_ultimate decision maker	7	Characteristics of knowledge teams, Roles of VT project lead
Roles of project lead for a knowledge team_consolidate contributions from the team into a coherent business case	6	Characteristics of knowledge teams, Roles of VT project lead
Roles of project lead for a knowledge team_set vision, direction and goals to be acheived	6	Characteristics of knowledge teams, Roles of VT project lead
Roles of project lead for a knowledge team_find projects and match an appropriate team to execute	1	Characteristics of knowledge teams, Roles of VT project lead
Differences in VT experiences during studies versus work_study group interactions require consensus led leadership	23	Differences in VT experiences between work and study
Differences in VT experiences during studies versus work_study teams must bridge the absence of a shared vision	11	Differences in VT experiences between work and study
Differences in VT experiences during studies versus work_at work the assigned leader expected to drive collaboration and motivation to achieve challenging goals	7	Differences in VT experiences between work and study
Differences in VT experiences during studies versus work_for studies different motivations inform behaviours	5	Differences in VT experiences between work and study
Differences between work and study conditions_work supports positional power required for transformational leadership	4	Differences in VT experiences between work and study
Differences in VT experiences during studies versus work_at work roles are preassigned	4	Differences in VT experiences

Code	Groundedness	Groups
		between work and study
Differences in VT experiences during studies versus work_for studies there is no pre-assigned leader	4	Differences in VT experiences between work and study
Differences between work and study conditions_special access to tools is expensive and often tied to cooperate contracts	3	Differences in VT experiences between work and study
Differences in VT experiences during studies versus work_leaders can arise driven by stronger motivation to succeed at target outcomes	3	Differences in VT experiences between work and study
Differences in VT experiences during studies versus work_students are given structured guidance for tasks	3	Differences in VT experiences between work and study
Types of virtual team settings_Academic study	2	Differences in VT experiences between work and study
Types of virtual team settings_work	2	Differences in VT experiences between work and study
Differences in VT experiences during studies versus work_at work there are direct consequences for non-performance	1	Differences in VT experiences between work and study
Differences in VT experiences during studies versus work_difficult to manage complex tasks well in learning contexts	1	Differences in VT experiences between work and study
Characteristics of virtual teams_interaction approach varies across teams	3	Differences in VT experiences between work and study, Effective behaviours for VTs
Empathy in interactions improves communication and collaboration	15	Effective behaviours for VTs
Ways of working by VTs_establish rules	11	Effective behaviours for VTs
Effective behaviours for effective teamwork collaboration_conscious navigation of personal weaknesses that may impede progress	6	Effective behaviours for VTs

Code	Groundedness	Groups
Types of rules set by VTs_mutual accountability	3	Effective behaviours for VTs
Types of rules set by VTs_honesty	2	Effective behaviours for VTs
Effective behaviours for effective teamwork collaboration_listening to others	1	Effective behaviours for VTs
Recommendations to advance VT effectiveness_research for insights to improve employ of VTs	1	Effective behaviours for VTs
Approach for effective employ of ICT_pragmatic individual approach to upskill self to operate required platforms	26	Experiences with ICT skills development
Experiences with ICT skills development_enjoyed playing around to learn new skills	6	Experiences with ICT skills development
Experiences with ICT skills development_self driven learning	6	Experiences with ICT skills development
ICT tools have become essential complements for VT interactions	3	Experiences with ICT skills development
Experiences with ICT skills development_peer coaching and guidance	2	Experiences with ICT skills development
ICT tools can be both positive and negative for team	1	Experiences with ICT skills development
ICT platforms employed by VTs_WhatsApp	24	ICT tools and platforms used
ICT platforms employed by VTs_Google Drive	14	ICT tools and platforms used
ICT platforms employed by VTs_Zoom	14	ICT tools and platforms used
ICT platforms employed by VTs_MS Teams	12	ICT tools and platforms used
ICT platforms & tools used by VT study team_email	5	ICT tools and platforms used
ICT platforms & tools employed by VTs_MS Powerpoint	4	ICT tools and platforms used
ICT platforms employed by VTs_shared drive	4	ICT tools and platforms used
ICT interaction is the new current and future normal way	2	ICT tools and platforms used
ICT platforms & tools employed by VTs_excel worksheets	2	ICT tools and platforms used

Code	Groundedness	Groups
ICT platforms & tools employed by VTs_videos	2	ICT tools and platforms used
ICT platforms & tools employed by VTs_Canva	1	ICT tools and platforms used
ICT platforms & tools employed by VTs_Dropbox	1	ICT tools and platforms used
ICT platforms & tools employed by VTs_LinkedIn	1	ICT tools and platforms used
ICT platforms & tools employed by VTs_recordings of meetings	1	ICT tools and platforms used
ICT platforms & tools employed by VTs_Skype	1	ICT tools and platforms used
ICT platforms & tools not often used by VT study team_email	1	ICT tools and platforms used
ICT platforms employed by VTs_SurveyMonkey	1	ICT tools and platforms used
Aspects of transformational leadership	9	Leadership behaviour experiences within VT interactions
Aspects of shared leadership_everyone takes ownership of the task at hand	7	Leadership behaviour experiences within VT interactions
Aspects of participative leadership	4	Leadership behaviour experiences within VT interactions
Aspects of transactional behaviour_exchange of information during task development activities	3	Leadership behaviour experiences within VT interactions
Aspects of shared leadership_reduces pressure and creates excitement to achieve	1	Leadership behaviour experiences within VT interactions
Aspects of situational leadership	1	Leadership behaviour experiences within VT interactions
Aspects of transactional behaviour_followers comply with leader directive	1	Leadership behaviour experiences within VT interactions
Questions to explore_has leadership style changed between virtual and physical team interaction?	1	Leadership behaviour experiences within VT interactions

Code	Groundedness	Groups
Suggestion that shared leadership is the opposite of transactional leadership	1	Leadership behaviour experiences within VT interactions
Limitations of VT interaction_not effective for complex brainstorming	3	Limitations of ICT interactions
Limitations of VT interaction_difficult to perceive nonverbal elements that are part of a full human communication interaction	2	Limitations of ICT interactions
Limitations of VT interaction_difficult to formulate inspiring solutions to complex challenges purely through virtual interaction	1	Limitations of ICT interactions
Limitations of VT interaction_difficult to hold attention of diverse audiences when dealing with complex material	1	Limitations of ICT interactions
Multiple competencies required for VT interaction_open minded to learn and be influenced	17	Multiple competencies required for VT interaction
Multiple competencies required for VT interaction_structuring	11	Multiple competencies required for VT interaction
Multiple competencies required for VT interaction_ability to use ICT platforms proficiently	9	Multiple competencies required for VT interaction
Multiple competencies required for VT interaction_negotiation and persuasion	8	Multiple competencies required for VT interaction
Multiple competencies required for VT interaction_assertiveness to speak up and be noticed	7	Multiple competencies required for VT interaction
Multiple competencies required for VT interaction_respectful to one another	7	Multiple competencies required for VT interaction
Multiple competencies required for VT interaction_engaging personality or approach in sharing knowledge	5	Multiple competencies required for VT interaction
Multiple competencies required for VT interaction_ability to communicate effectively	5	Multiple competencies required for VT interaction
Multiple competencies required for VT interaction_ability to use multiple ICT platforms proficiently	4	Multiple competencies

Code	Groundedness	Groups
		required for VT interaction
Multiple competencies required for VT interaction_supportive and encouraging	4	Multiple competencies required for VT interaction
Multiple competencies required for VT interaction_communication and leads to collaboration which improves task completion	3	Multiple competencies required for VT interaction
Multiple competencies required for VT interaction_employ of multiple leadership styles as situations arose	2	Multiple competencies required for VT interaction
Multiple competencies required for VT interaction_self discipline	2	Multiple competencies required for VT interaction
Multiple competencies required for VT interaction_confidence in own skills and knowledge	1	Multiple competencies required for VT interaction
Roles established to drive VT interaction_a chairperson	1	Multiple competencies required for VT interaction
Roles established to drive VT interaction_a secretary	1	Multiple competencies required for VT interaction
Participant sentiment towards VT interaction_frustration	4	Participant attitude towards with VT interactions
Participant sentiment towards VT interaction_feeling inadequate when technology fails	3	Participant attitude towards with VT interactions
Participant sentiment towards VT interaction_tough and difficult	3	Participant attitude towards with VT interactions
Participant sentiment towards VT interaction_prefer human interaction	2	Participant attitude towards with VT interactions
Participant sentiment towards VT interaction_filled with dread	1	Participant attitude towards with VT interactions
Participant sentiment towards VT interaction_loving it	1	Participant attitude towards with VT interactions

Code	Groundedness	Groups
Roles of VT project lead_moderate team interaction to optimise contributions	11	Roles of VT project lead
Roles of VT project lead_hold members accountable to deliverables	7	Roles of VT project lead
Roles of VT project lead_bold enough to hold self-accountable to members	6	Roles of VT project lead
Roles of VT project lead_build a plan to guide task completion approach	3	Roles of VT project lead
Roles of VT project lead_check quality of work	3	Roles of VT project lead
Roles of VT project lead_lead the team to enagage organisational heirarchy to feel embedded	3	Roles of VT project lead
Roles of VT project lead_monitor project milestones	3	Roles of VT project lead
Roles of VT project lead_make team members feel included	2	Roles of VT project lead
Roles of VT project lead_assign tasks to project team members	1	Roles of VT project lead
Roles of VT project lead_request improvements from team members	1	Roles of VT project lead