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The Role of Leader-Member Exchange (LMX) and Team Collaboration on Knowledge Sharing and Knowledge Application

By

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The Role of Leader-Member Exchange (LMX) and Team Collaboration on Knowledge Sharing and Knowledge Application

Hady Makhlouf

ABSTRACT

The recent global pandemic exposed organizations and companies to numerous challenges that obliged them to adjust their initial operations as a response strategy to the sternly changed environment. One of the key affected areas by the pandemic was the work settings in organization, and this came as a result of lockdown measures imposed by health authorities. As a result, many organizations shifted to remote and hybrid working arrangements for their employees. Organizations realized that it is important for them to refocus and emphasize more on their internal development in order to be ready for such unforeseen changes in the environment. One of the fundamental areas that organizations ought to focus on is knowledge sharing and knowledge application among employees working in teams. In addition, organizations should focus on quality leader-member or subordinate exchange and how it affects employees' commitment to their assigned roles or duties. Knowledge sharing and application has the potential of permitting organizations to unlock strategies that can be instrumental in enabling them maneuver through the adverse effects resulting from black swan events such as the pandemic. As such, this study was set to explore the association between Team Collaboration and Knowledge Sharing, and Knowledge Application respectively. The study also explored the moderating (strengthening or weakening) effect of Leader-Member Exchange on these associations. Using data collected from 202 respondents (a sample from the targeted population) and analyzing that data by using Generalized Regression Model and Person's Correlation Tests, the study found that Team Collaboration positively relates with Knowledge Sharing and Knowledge Application. However, Leader Member Exchange was found to have no significant effect on these relationships. The outcome of this study suggests that organizations should emphasize more on collaboration amongst employees to enhance knowledge sharing and application, and ultimately improve their efficiency in addressing challenges emanating from unforeseen situations.

Keywords: Team, Collaboration, Knowledge, Sharing, Application, Leader-Member Exchange, Teamwork, Leadership

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CHAPTER ONE

INTRODUCTION

1.1. Introduction

The global pandemic caused disruption to organizations, economies, and the world in general. To meet these challenges, organizations had to adjust not only their work settings, i.e., remote or hybrid workplaces, but also companies needed to focus more on their internal development and mobility. Most employees believe that learning by peer observation, having a supervisor that provides mentoring, having access to the latest trends and practices, and getting on-the-job experience are what they need to perform better and boost their careers. These practices are facilitated in the organization by the relationship between a leader and their subordinate and by utilizing the collective knowledge of employees. Contemporary researchers are interested in the relationship between knowledge sharing and leader-subordinate exchange, that is, the dyadic relationship between a supervisor and a subordinate, which is one of the most important relationships in an organization. A supervisor provides subordinates with guidance, assesses their performance, leads, delegates, and provides feedback. The current study investigates the effect of the relationship between a leader and their subordinates and team collaboration on knowledge sharing and knowledge application.

1.2. General Background

Knowledge Management is an important function in any HR Department in the era of the knowledge-based economy. Organizational knowledge is a valuable and limited resource that holds significant strategic importance, offering a competitive advantage that is difficult for

competitors to replicate. (Hao, Yang, & Yijun , 2019). Knowledge Sharing is considered one of the most essential activities for achieving organizational effectiveness because individuals' knowledge sharing is one of the pillars for innovation and the creation of new knowledge (Quigley, Tesluk, Locke, & Bartol, 2007). However, employees tend not to share their knowledge, thoughts, and experience with their colleagues as they perceive it as a valuable resource and a power source (Lee, Kim, & Yun, 2018). In this regard, motivating employees to share knowledge is considered a challenging job, unless there is an individual benefit such as self-interest or personal gain (Pee & Lee, 2015); a group benefit, reciprocal behaviors, relationship with others (Chae, Seo, & Lee, 2015); or an organizational benefit, such as organizational gain or support (Jeung, Yoon, & Choi, 2017).

HR professionals have an active role in promoting knowledge in an organization by inspiring a knowledge sharing attitude in newcomers and utilize training and performance management systems to encourage creativity, innovation, and knowledge transfer and application. Currently, there are many knowledge management systems that facilitate knowledge sharing among employees, however, recent studies have begun to investigate the effect of the quality of a follower's relationship with their leader on that individual's knowledge sharing due to the significant role that the quality of this relationship plays in promoting unrestricted employee behaviors (Kim, Han, & Son, 2017). For instance, several studies have revealed that the relationship between transformational leadership and knowledge sharing behavior (KSB) is influenced by factors such as perceived team goal commitment and perceived team identification. (Liu & Li, 2018). Lee et al. (2018) study about abusive supervision and knowledge sharing behavior revealed a negative relationship between them. In this study, we intend to fill the gap by

exploring how knowledge sharing and knowledge application is affected by the leader-subordinate relationship and team collaboration.

Remote teams are becoming more common in the age of technological innovation and globalization. To sustain a competitive advantage and inspire innovation in such environment, the creation and application of knowledge became increasingly important (Stojanović-Aleksić, Erić Nielsen, & Bošković, 2019). Creating an effective and efficient knowledge management system can support the business and help them make appropriate decisions (Ammirato, Linzalone, & Felicetti, 2021). Knowledge is managed in three phases, creation, dissemination and utilization (Darroch, 2003). Since knowledge has a little value unless it is used, Knowledge application is regarded as one of the most important parts of knowledge management process (Ouakouak, AlBuloushi, Ouedraogo, & Sawalha, 2021) Hamdoun el al, (2018). Researchers have noted that knowledge application can improve financial performance, enhance productivity, and promote innovation (Ouakouak et al., (2021) (Hamdoun el al, (2018)). Knowledge has little value unless it is put to use, thus according to (Ouakouak, AlBuloushi, Ouedraogo, & Sawalha, 2021), knowledge application is considered as one of the crucial processes of knowledge management. While remote teams overcome constraints of time and locations for international organizations, these teams are exposed to unique challenges to organizations.

Despite the importance of knowledge application, the current body of literature has focused extensively on the role of knowledge creating and knowledge sharing (Kozhakhmet, Jayasingam, Majeed, & Jamshed, 2020). Literature has indicated that knowledge application is an understudied topic in knowledge management research with very few studies focusing on it (Mahmud, 2022). Recently, the utilization of collective knowledge of teams in organizations is an interest for many scholars and leaders (Horwitz, 2005). Knowledge management systems have facilitated

knowledge sharing across units or departments in an organization, however these tools may not necessarily facilitate the application of knowledge (Nesheim, Olsen, & Tobiassen, 2011). Research on knowledge application has explored the individual and organizational factors that facilitate it. Intrinsic motivation, learning culture, trust and leadership were identified as factors that empowers knowledge application (Nesheim, Olsen, & Tobiassen, 2011); (Mahmud, 2022). In addition, according to (Ishak, Naqshbandi, Islam, & Haji Sumardi, 2022), affective and normative organizational commitment positively influence knowledge application in the context of COVID-19 pandemic. Barriers for knowledge application can be linked to different factors. Some related to technological factors such as absence technical support and tools to deplete this knowledge, others related to organizational, process and human factors such as the absence of management support or incentives for knowledge application. Organizations should realize that people-related factors are important in influencing the application of knowledge (Naqshbandi & Tabche, 2018). According to a report done by Deloitte, technology alone cannot facilitate the benefits of knowledge (Deloitte Insights, 2021). Thus, one of the factors that can influence employees' work and knowledge application is leader subordinate exchange (LMX).

1.3. Significance of the Study

This study not only extends but bridges the gap in literature regarding knowledge-based theory by providing a better understanding on how knowledge sharing, and knowledge application is enhanced through LMX and Team Collaboration. The findings from this study will contribute towards the development and advancement of knowledge management literature with new and useful insights. The study proposes and tests a model using data collected from employees working in organizations in the MENA region. Organizations as well as researchers and other relevant

entities can benefit greatly from the findings of this study as they will be able to understand the fundamental and underlying factors that enhances knowledge sharing and knowledge application in teamwork.

1.4. Need of the Study

While previous studies have explored the relationship between LMX and Knowledge sharing and the mediating effect of feedback seeking behavior (Farooq & Tripathi, 2021), this study intends to contribute to such literature in various ways. According to a recent study by LinkedIn, The LinkedIn Workplace Learning report 2021, referred to leaders as a "Skill Building Weapon" (LinkedIn, 2021). The survey results indicated that 49% of Learning and Development professionals are cooperating with managers to drive learner engagement and skill building. Thus, understanding the LMX relationship on knowledge sharing as well as how feedback seeking behavior moderates this relationship is an important element of this study as it aims to unveil how LMX impacts knowledge sharing activities in an organization.

Additionally, this study examines the impact of LMX on knowledge sharing and knowledge application. LLX (Leader-Leader Exchange) is defined as the exchange relationship between the supervisors and their own managers (Zhou, Wang, Chen, & Shi, 2012). Leaders who are supported by the top management tend to have higher status in an organization which is perceived as high LLX. This allows them to unlock their potential to contribute and manage their teams (Chen, Feng, Liu, & Yao, 2021). Although scholars have highlighted the importance of LMX on knowledge sharing and knowledge application, it is still unclear how this relationship can facilitate both knowledge sharing and knowledge application. According to Ishak, Naqshbandi, Islam, & Haji Sumardi (2022), the relationship between LMX and knowledge application should be further

explored. Hence, this study contributes to the advancement of knowledge regarding LMX and knowledge application.

Furthermore, organizations of today are constantly faced with the changing environment both in the market and technological landscape. Knowledge sharing and application among employees is one of the fundamental means that organizations can exploit to ensure that they promptly respond to changes in the market or technological landscape. However, this requires comprehensive understanding of the basic and advanced aspects of knowledge sharing and application not just at individual level but also team level. Such understanding should include fundamental and underlying factors affecting knowledge sharing and application, and this study intends to look into one of these factors which is LMX.

1.5. Objectives of the Study

The main objective of this study is to explore the relationship between Team Collaboration and Knowledge Sharing, and Knowledge Application, and further examine the moderating effect of Leader-Member Exchange (LMX) on these relationships.

The specific objective of this study include:

1. To determine the relationship between team collaboration and knowledge sharing.
2. To examine the relationship between team collaboration and knowledge application.
3. To investigate the moderating effect of leader-member exchange (LMX) on the relationship between team collaboration and knowledge sharing.
4. To explore the moderating effect of LMX on the relationship between team collaboration and knowledge application.

1.6. Research Hypotheses

To achieve the above outlined objectives, this study will endeavor to test the following research hypotheses.

Hypothesis 1: Team collaboration is positively linked to knowledge sharing.

Hypothesis 2: Team collaboration is positively linked to knowledge application.

Hypothesis 3: LMX moderates the impact of Team collaboration on knowledge sharing, the higher the quality of LMX, the stronger the relationship will be.

Hypothesis 4: LMX moderates the impact of Team collaboration on knowledge application, the higher the quality of LMX, the stronger the relationship will be.

1.7. Statement of Problem

Despite the recognized importance of team collaboration in promoting knowledge sharing and application in literature (Hao, Yang, & Yijun , 2019), there is a gap in understanding how leader-member exchange (LMX) quality influences the relationship between team collaboration and knowledge outcomes. Specifically, there is limited empirical evidence on the moderating effect of LMX on the relationship between team collaboration and both knowledge sharing and knowledge application. To address this gap, there is a need to investigate the extent to which LMX quality enhances or weakens the impact of team collaboration on knowledge sharing and knowledge application within teams.

By exploring this research problem, the study aims to contribute to the existing literature by examining the role of LMX as a potential moderator, shedding light on how the quality of leader-member relationships may influence the relationship between team collaboration and knowledge

outcomes. The findings of this research could provide valuable insights for organizations and team leaders in enhancing knowledge-related processes and optimizing team performance.

1.8. The Conceptual Model

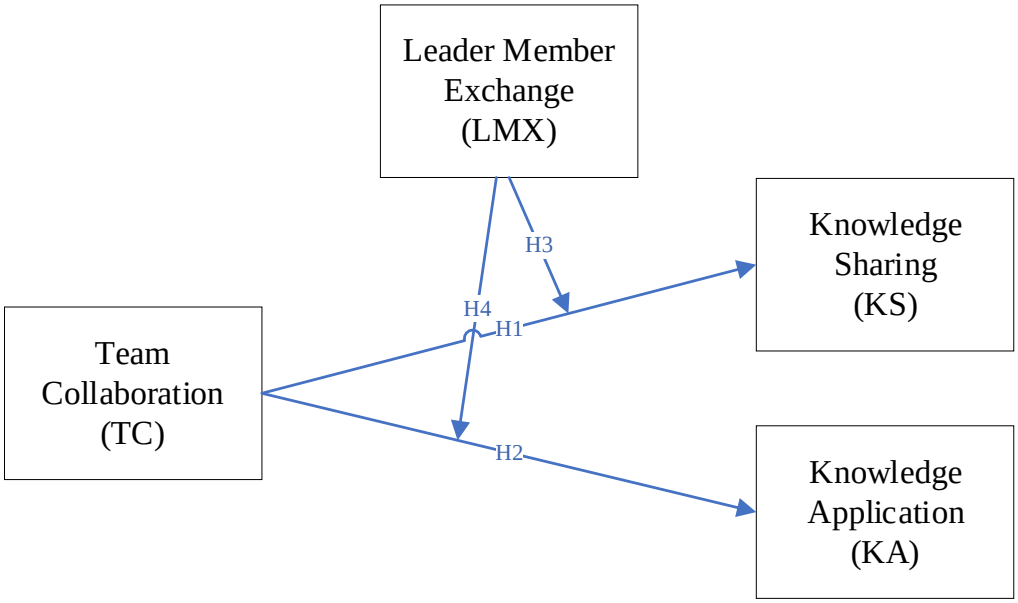

Figure 1: Conceptual Model

1.9. Thesis Structure

This research endeavor adheres to a formal and conventional structure, which is delineated as follows:

Chapter 1: Introduction

Chapter 2: Literature Review and Theoretical Framework

Chapter 3: Methodology

Chapter 4: Data Analysis and Results

Chapter 5: Hypothesis Testing and Results

Chapter 6: Discussion and Conclusion

CHAPTER TWO

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Leader-Member Exchange (LMX)

The LMX theory focuses on the quality of leader-member relationship which is based on the law of reciprocity (Farooq & Tripathi, 2021). It helps scholars study the influence of leadership on different organizational elements (Ishak, Naqshbandi, Islam, & Haji Sumardi, 2022)

According to LMX theory, leaders interact with subordinates in a distinctive way with each member (Graen & Uhl-Bein, 1995). This dyadic exchange relationship between leaders and followers falls on a continuum that ranges from a transactional based relationship (low quality) to a transformational based relationship (high quality) (Kuvaas, Buch, Dysvik, & Haerem, 2012). Low-quality LMX relationships are distinguished by disrespect, disloyalty, and lack of trust (Dechawatanapaisal, 2021). Thus, low-quality LMX is limited to the necessary exchanges that occur according to the employment contract (Dansereau, Graen, & Haga, 1975).

High-quality LMX relationships, on the other hand, are characterized by loyalty, trust, and respect. Those in high-quality LMX relationships go beyond what a formal job description entails to an exchange of tangible and intangible resources (Dansereau, Graen, & Haga, 1975). The extant literature indicates that each unique LMX relationship elicits different follower responses, attitudes, and performance behaviors (Illies, Nahragang, & Morgeson, 2017). Scholars have highlighted the role of the quality of leader-member exchange in determining employee work outcomes (Varma, Jaiswal, Pereira, & Kumar, 2022). Leadership's importance is highlighted in the ever-changing environment that businesses are facing. As such, high quality LMX is needed

to help improve employee performance by influencing knowledge sharing, knowledge application, and team collaboration.

2.2 Team Collaboration

Collaboration is defined as a process focused on the collective efforts of employees united in pursuing a common goal (Bond-Barnard, Fletcher, & Steyn, 2018). Thus, individuals work together to achieve a shared objective, combining their skills, expertise, and efforts. Collaboration is essential to achieving complex and challenging tasks, as it allows individuals to pool their resources and ideas and come up with innovative solutions. Teamwork is described as an effective means to achieve better results and enhance team output (Pitafi, Kanwal, Ali, Khan, & Ameen, 2018). Teamwork is crucial in ensuring that team members work effectively and efficiently towards a common goal and can be a powerful driver of organizational success. Employees are more likely to collaborate as a team when they are goal-oriented toward success and when there are internal connections between them (Wolfe & Shepherd, 2015).

Team members are focused on achieving shared goals, and they work closely together to achieve them. In addition, team collaboration requires a high degree of trust, open communication, and mutual respect among team members. According to (Laursen & Foss, 2003), knowledge sharing and collective decision-making boost team effectiveness. Thus, teams that actively share knowledge and engage in collective decision-making are more effective than those that do not. By sharing knowledge and insights, team members can build on each other's ideas, avoid redundant work, and make more informed decisions. In addition, as compared with individuals working alone, team members with higher knowledge absorption and enriched competences are better able to think creatively, encourage unconventional thinking, and increase effectiveness (Langfred, 2007). Teams with diverse skills, expertise, and perspectives are more likely to be innovative and

effective, as team members can draw on their individual strengths to find creative solutions to complex problems.

2.3 Knowledge Sharing

To sustain a competitive advantage, organizations rely on assets that are rare and difficult to imitate. Thus, implementing strategies such as the resource-based view of the organization, which emphasizes the importance of leveraging unique human capital and organizational assets to provide a competitive advantage (Cummings, 2004). The exchange of knowledge between employees is an important factor of organizational knowledge process (Cabera & Cabera, 2002). Knowledge sharing is the channel through which expertise in an organization is communicated and transmitted. This means that the transfer of knowledge from one employee to another is critical to ensuring that the organization can leverage its unique resources and capabilities. Research has identified that the path dependency characteristic is responsible for the uniqueness of knowledge and that it differs from one organization to another (Oyemomi, Liu, Neagra, Chen, & Nakpodia, 2019).

An organization’s knowledge assets are unique to that organization, and they cannot be easily replicated by competitors. Path dependency refers to the idea that an organization's history, culture, and context shape its current resources and capabilities. As a result, the unique knowledge assets of an organization are a product of its history and cannot be easily replicated by competitors. Knowledge sharing (KS) is the channel through which expertise in an organization is communicated and transmitted (Ertek, Tokdemir, Sevinc, & Tunc, 2017). Knowledge sharing is essential for organizations to leverage their unique knowledge assets and create a competitive advantage.

Employees can collaborate effectively and develop new insights, products, and services that can create value for the organization by sharing their knowledge and expertise. In short, by identifying and leveraging unique resources and capabilities, organizations can differentiate themselves from competitors and achieve a sustainable competitive advantage. Furthermore, by facilitating the transfer of knowledge between employees, organizations can ensure that their unique knowledge assets are effectively utilized and leveraged to achieve organizational objectives.

2.4 Knowledge Application

Knowledge management has increasingly attracted academics and managers' attention, even though it is a relatively young discipline (Farooq & Tripathi, 2021). Researchers have argued that sharing knowledge is not enough; to improve organizational effectiveness, knowledge must be applied effectively to solving problems and delivering products and services (Ouakouak & Ouedraogo, 2019). A knowledge-based view of an organization suggests that the objective of knowledge management is to ensure the effective application of knowledge by individuals and teams within the organization (Duan, Huang, Cheng, Yang, & Ren, 2021). Due to the current business challenges, knowledge application is crucial for maintaining a company and adjusting to the demands of the dynamic, competitive business environment (Tønnessen, Dhir, & Flåten, 2021).

Several definitions have described knowledge application in the current knowledge management literature. According to (Song, Van Der Bij, & Weggeman, 2005), knowledge application is the utilization of knowledge that has been shared. Knowledge application is defined as retrieving and using knowledge to assist in decisions, actions, problem-solving, automating routine work, and providing job aids and training (Rastogi, 2000). Knowledge action, problem-solving, and decision-making are all behaviors aimed at the actualization of knowledge, which is the objective of

knowledge application (Abubakar, Elrehail, Alatailat, & Elçi, 2019). In this study, knowledge application serves the practical application of shared and acquired knowledge for work routines, decision-making, and problem-solving (Ishak N. I., 2021).

Scholars have explored the barriers to knowledge application, which include, improper alignment of knowledge with organizational goals, scarcity of collaborative work groups and poor coordinator of organizational functions (Ranjbarfard, Aghdasi, Lopez-Saez, & Lopez, 2014). Other scholars (Mahmud, 2022) & (Ishak, Naqshbandi, Islam, & Haji Sumardi, 2022), have explored the enabling factors of knowledge application, such as intrinsic motivation, learning culture, organizational commitment, trust and leadership. However, regardless of these important studies, knowledge application literature is still in its early stages and there are many aspects uncovered.

2.5 Research Model and Hypotheses Development

According to previous research, organizations can gain a competitive advantage by identifying and leveraging knowledge resources for their employees. In virtual team settings, knowledge sharing has a positive impact on trust, collaboration, and team effectiveness. Additionally, trust moderates the relationship between collaboration and team effectiveness, with higher levels of trust leading to better outcomes (Alsharo, Gregg, & Ramirez, 2017).

The Knowledge-Based Theory of the Firm, which posits that knowledge is a strategic resource that provides firms with a competitive advantage, has been extensively discussed in the literature. Grant (1996) emphasizes the importance of knowledge creation by individuals within organizations, which is then integrated, stored, and applied by the organization as a whole. Davenport & Prusak (2000) also argue that the ability to manage knowledge effectively is a key driver of competitive advantage. Furthermore, researchers have explored how knowledge is

created and transferred within organizations through knowledge management initiatives (Nonaka & Takeuchi, 1995). Overall, the knowledge-based theory highlights the significance of knowledge as a key resource for organizations and underscores the importance of effective knowledge management strategies to enhance competitiveness.

LMX refers to the relationship between a leader and their followers, emphasizing the nature of the exchange between them (Graen & Uhl-Bein, 1995). LMX theory suggests that leaders form unique relationships with each of their subordinates, and these relationships can have different levels of trust, support, and communication. The quality of LMX has been found to be positively related to knowledge sharing among team members (Yin, Ma, Yu, Jia, & Liao, 2020).

Social Exchange Theory is a prominent perspective in organizational behavior that explains how people's actions and decisions are shaped by social interactions and exchanges. Several studies have explored the application of Social Exchange Theory in various organizational settings. For instance, (Xuecheng & Iqbal, 2022) examined how Social Exchange Theory can be used to enhance employee engagement and retention in the workplace. Similarly, (Yu, 2022) explored the role of Social Exchange Theory in predicting organizational citizenship behavior among employees. Additionally, (Kim & Vandenberghe, 2021) investigated the relationship between social exchange and organizational commitment. These studies suggest that Social Exchange Theory is a useful lens for understanding the social dynamics in organizations and can provide insights into how to improve employee motivation and behavior.

Previous research suggested that for virtual teams to be efficient, distributed knowledge should be adequately shared and integrated by team members. If not, these teams would suffer from high cost to search for information, failure in communication, misinterpretation of information and data which might lead to inadequate decision making (Alsharo, Gregg, & Ramirez, 2017). Knowledge

sharing is important within teams in order to integrate the different disciplines, ideas, knowledge and information possessed by the different team members. Knowledge sharing also enables effective team outcomes, by ensuring that the information is available for task performance and decision making, allowing teams to accomplish their work requirements and contribute to organizational goals. Thus, we hypothesize:

H1: *Team collaboration is positively linked to knowledge sharing.*

Even though knowledge sharing is an essential step in the knowledge management process, it does not guarantee the application of the shared knowledge by organizational members (Dahandler, O'Mahony, & Gann, 2016). Effective knowledge application is a crucial component of cross-border knowledge management (Xu, Houssin, Caillaud, & Gardoni, 2010) . However, the mere creation, storage, retrieval, and transfer of knowledge may not lead to exceptional innovation performance because effective innovation relies on transforming knowledge into practical action, or effective knowledge application (Alavi & Leidner, 2001). The primary objective of knowledge management is to enable organizations to use acquired knowledge effectively to generate business value for customers (Donate & De Pablo, 2015), and the effectiveness of innovation depends on knowledge management activities (Carneiro, 2000). According to Donate and de Pablo (2015), the better the effectiveness of applied knowledge in the knowledge management process, the higher the innovation performance of the firm will be. Recent studies have established a strong correlation between knowledge application ability and innovation output. Effective problem-solving using shared knowledge leads to the realization of its value (Alavi & Leidner, 2001), and firms that possess strong knowledge utilization abilities can continuously innovate and create new products and services. Lee et al. (2013) suggest that effective knowledge application can enhance the development of new products and production/processing technologies, thereby improving

innovation performance. Thus, organizations must strengthen their application of both internal and external knowledge to achieve better innovation outcomes. On the other hand, Organizations can use internal knowledge-sharing networks to apply knowledge from different (Ferraris, Santoro, & Dezi, 2017) , with a wider source of knowledge and greater heterogeneity. Knowledge sharing networks are organizational networks that take various forms and refer to the internal relationships and connections within and between individuals, teams and departments that facilitate the sharing and transfer of knowledge and information. Team collaboration is closely linked to knowledge-sharing networks as effective collaboration often requires the sharing and integration of knowledge and information among team members. Thus, we hypothesize:

H2: *Team collaboration is positively linked to knowledge application*.

LMX refers to the quality of the relationship between a leader and their team members, and is characterized by mutual trust, respect, and support. High quality LMX such as transformational can positively impact team collaboration. According to previous leadership, Transformational leadership has the potential to impact inter-team collaboration by enhancing the internal teamwork quality (Cha, Kim, Lee, & Bachrach, 2015). When leaders establish high-quality LMX relationships with their team members, they are more likely to effectively to provide individualized consideration, intellectual stimulation, and inspirational motivation (Cha, Kim, Lee, & Bachrach, 2015). Leader-member exchange (LMX) theory suggests that the quality of the relationship between a leader and their team members can influence knowledge sharing. Specifically, higher quality LMX relationships, characterized by trust, respect, and mutual obligation, can lead to increased knowledge sharing among team members (Wang, Chin, & Lin, 2020). Leaders who develop strong LMX relationships with their team members are likely to be seen as more credible and trustworthy, which can increase employees' willingness to share knowledge with them and

with other team members (Hao, Shi, & Yang, 2019). Leaders who focus on building strong relationships with their team members and promoting a culture of trust, respect, and collaboration are more likely to foster a positive and productive work environment that encourages team collaboration and knowledge sharing. Thus, we hypothesize:

H3: *LMX moderates the impact of team collaboration on knowledge sharing, the higher the quality of LMX, the stronger the relationship will be.*

Several factors can play a vital role in facilitating knowledge application, as discussed by Mahmud (2022), and Ishak, Naqshbandi, Islam, & Haji Sumardi (2022). These factors include intrinsic motivation, which drives individuals to apply knowledge for personal growth and development. A culture of learning also encourages individuals to share their knowledge and learn from one another, leading to more effective knowledge application. Additionally, organizational commitment and trust foster a positive environment where individuals feel comfortable sharing their knowledge and ideas without fear of judgment or repercussions. Finally, effective leadership can also facilitate knowledge application by providing direction, guidance, and support for individuals and teams to apply their knowledge effectively. When employees have high-quality relationships with their leaders, characterized by trust, respect, and mutual obligation, thus are more likely to engage in knowledge transfer behaviors such as knowledge seeking, sharing, and application (Wang, Chin, & Lin, 2020). Additionally, high quality LMX, such as leaders who exhibit transformational leadership behaviors, such as providing intellectual stimulation and individualized consideration, can positively impact knowledge application within their teams (Cha, Kim, Lee, & Bachrach, 2015).

H4: *LMX moderates the impact of team collaboration on knowledge application, the higher the quality of LMX, the stronger the relationship will be.*

CHAPTER THREE

REASERCH METHODOLOGY

This chapter details the research methodology that was adopted in carrying out the study. Additionally, it outlines the data collection procedure, and statistical methods used by the researcher to analyze the gathered data. The instruments used to collect data is described in detail in this chapter including scale construction. The research's targeted population has also been pronounced briefly in this chapter.

3.1 Construct Operationalization

A validated survey questionnaire with established scales was used to evaluate the construct validity of the conceptual model. The questionnaire includes items related to Leader-Member Exchange (LMX), Team Collaboration (TC), Knowledge Sharing (KS), and Knowledge Application (KA). The responses gathered from the survey were analyzed using IBM SPSS software to provide statistical evidence for testing the research hypotheses.

3.2 Ethical Consideration

The study was carried out in accordance with ethical principles and guidelines. Participants' anonymity and confidentiality were respected, and no detailed personal information was collected. A consent form was included with the survey to ensure that participants provided their voluntary consent to participate. The researcher was mindful of the necessary ethical considerations during the survey's construction and administration, in accordance with CITI program standards.

3.3 Population and Instrumentation

The targeted population that this study intends to explore are individuals working in different organizations but reside in the MENA region. More precisely, the research targets only employed individuals that work in organizations or companies located in the MENA region.

The instrument used to collect data from a sample of targeted population was a survey questionnaire. The survey instrument was developed using "Google Forms" and disseminated to potential respondents through email, LinkedIn, WhatsApp, and other social media channels. The survey was designed with closed-ended questions. The google survey was designed specifically for the study of testing the moderating effect of leader member exchange on the relationship between team collaboration, knowledge sharing and knowledge application.

The survey consists of 6 sections. Section one of the survey questionnaire contained the title of the survey and consent form including “I wish to participate in the survey” and “I do not wish to participate in the survey” button indicating if the respondent agrees to participate in the survey study or not. Section two examines the respondents’ demographics including gender, age, employment sector, position currently held, and educational level. Sections three, four, five, six includes questions on team collaboration which is the independent variable, leader member exchange as a moderator, and knowledge sharing and knowledge application as the dependent variables respectively. For a copy of the questionnaire, please refer to Appendix 1. The survey received approval from the Institutional Review Board (IRB) at Lebanese American University (LAU) prior to distribution, and a copy of the IRB approval letter can be found in Appendix 2.

3.4. Scale Development

3.4.1 Independent Variable

The items for assessing team collaboration were adapted from the study of (Bond-Barnard, Fletcher, & Steyn, 2018) and consisted of four statements that measured the quality of collaboration within a team. Respondents were asked to rate their agreement with the statements on a 5-point Likert scale ranging from 'Strongly Disagree' to 'Strongly Agree' (see Appendix, Figure A2).

3.4.2 Moderating Variable

The items for assessing leader-member exchange were adapted from the study of (Graen & Uhl-Bein, 1995) and consisted of seven statements that measured the quality of leader-subordinate within an organization. Respondents were asked to rate their agreement with the statements on a 5-point Likert scale ranging from 'Strongly Disagree' to 'Strongly Agree' (see Appendix, Figure A2).

3.4.3 Dependent Variables

The items for assessing knowledge sharing were adapted from the study of (Chuang, Jackson, & Jiang, 2016) the consisted of seven statements that measured knowledge sharing within an organization. The items for knowledge application were adapted from the study of (Ouakouak & Ouedraogo, 2019) and consisted of five statements that measured knowledge application within an organization. Respondents were asked to rate their agreement with the statements on a 5-point Likert scale ranging from 'Strongly Disagree' to 'Strongly Agree' (see Appendix, Figure A2).

3.5. Data Collection

Data collection was conducted using a survey that was distributed electronically through the use of e-questionnaires. The survey was disseminated to eligible individuals through various channels, including electronic mail, WhatsApp, LinkedIn, and other social media platforms. Given the challenges of accessing members of the targeted population, the researcher utilized the snowball sampling technique to partially achieve the desired sample size. Snowball sampling is a non-probabilistic sampling technique where current study participants recruit future participants from their connections and acquaintances.

The data collection process spanned four weeks, and participation was voluntary. Only respondents who agreed to participate after reading and understanding the consent form were allowed to proceed with responding to the questionnaire. Those who chose not to proceed, even if they had already provided responses to the questionnaire, were not permitted to continue. The entire process adhered to and followed the guidelines set forth by the LAU IRB.

3.6. Survey Administration

The survey was conducted virtually using online methods. Specifically, the questionnaire was distributed to participants through social networking platforms like Facebook, direct email, and professional networking sites such as LinkedIn. Although the target was to collect 250 responses within a limited time frame, only 204 responses were received. Two responses were excluded from the study as the participants indicated their lack of consent. The researcher analyzed the remaining 202 responses using IBM SPSS.

3.6.1. Descriptive Statistics

Descriptive statistics were used by the researcher in understanding the demographic characteristics of the participants. Bickel & Lehmann (1975) point out that descriptive statistics can be used to measure different characteristics of a population. Demographical data such as age, employment sector, and gender of the participants were summarily analyzed using descriptive statistics.

3.6.2. Reliability and Validity of Constructs

Cronbach's Coefficient Alpha was adopted by the researcher to assess the reliability and internal consistency of each of the studied variables constructs. A minimum Cronbach's Alpha value of 0.70 was considered for an item to be regarded appropriate for research (Cronbach, 1951). Cronbach's Alpha values above 0.7 were considered to indicate a substantial inter-correlation between variable constructs.

3.6.3 Confirmatory Factor Analysis (CFA)

The researcher employed Confirmatory Factor Analysis (CFA) to identify and understand the relationship between unobserved variable constructs (also known as latent variables) and observed variables. Observed variables constructs are the statements or questions in the survey questionnaire that participants in the study provides responses to while unobserved or latent variables are dormant or underlying variables.

3.6.4. Multivariate Generalized Regression Model Analysis

To explore whether or not, the moderating variable (Leader-Member Exchange) has effects on the potential relationship between the dependent variables (knowledge sharing and knowledge

application), and the independent variable (Team Collaboration) a Multivariate Generalized Regression Model Analysis (MGRM) was performed on the gathered data using IBM SPSS. The adoption of MGRM instead of Hayes Process Macro Model was based on the fact that the variables studied in this research were categorical variables as they pertained to data gathered from Likert Scale Constructs. Hayes Process Models are mainly appropriate for continues data and not ordinal or categorical data (Hayes, 2018).

CHAPTER FOUR

DATA ANALYSIS AND RESULTS

4.1 Descriptive Statistics

Descriptive statistics was used to describe the demographics of the sampled population. The demographics gathered on sample population included age, gender, sector of employment, education level, and job position in their place of work. In the following subsections, the outcome of the analysis on each of these demographic characteristics are presented in frequency distribution tables and discussed further.

4.1.1 Gender of the sample population

The sample population comprised of both male and female participants, as well as individuals that identify with types of gender. The following frequency distribution table shows the distribution of the male and female participants from the sample population data.

Table 1: Gender of the sample population

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	96	47.5	47.5	47.5
	Male	103	51.0	51.0	98.5
	Prefer not to say	3	1.5	1.5	100.0
	Total	202	100.0	100.0	

As shown in the table above, out of the 202 participants, 51% were male while 47.5% were female respondents. However, 1.5 % were participants that identify with other types of gender since they preferred not to say the gender that they belonged to instead of opting for either being a male or female individual.

4.1.2 Age of the sample population

The sample population was made up of individuals belonging to different age groups which included 18-24 years (belonging to Generation Z), 25-34 years (belonging to Millennials), 35 – 44 years (partly belonging to Generation X and partly belonging to Millennials), 45-54(partly belonging to Generation X, and partly belonging to Millennials), 55 – 64 (partly belonging to Baby Boomers, and partly belonging to Generation X), and over 64 years (belonging to The Silent Generation). The following table is a frequency distribution table showing the frequencies of each of these age groups from the sample population data.

Table 2: Age Distribution of the Sample Population

Age					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18 - 24	34	16.8	16.8	16.8
	25 - 34	109	54.0	54.0	70.8
	35 - 44	40	19.8	19.8	90.6
	45 - 54	13	6.4	6.4	97.0
	55 - 64	6	3.0	3.0	100.0
	Total	202	100.0	100.0	

From the analysis outcome presented above, a large portion of the respondents or participants (54%) belonged to age group 25-34 years which falls under millennials based on the definitions of generations. Millennials are people whose birth years lies between 1981- 1995. Only 3% of the participants were individuals whose ages belonged to age group 55-64 years which partly falls under Baby Boomers and partly falls under Generation X. Baby Boomers are people who were born between 1946 and 1964 while Generation X are people who were born between 1965 and 1981. A significant portion (19.8%) of the participants were individuals whose ages belonged to the age group 35-44 years which partially belongs to Generation X and partially belongs to Millennials. None of the participants were of 64 years and above (or belonged to the Silent Generation).

4.1.3 Sector of employment of the sample population

The sample population comprised of individuals working in different sectors or industries across the MENA (Middle Eastern and North Africa) region. The respondents or participants were asked to indicate the sector or industry in which they work from a list of 27 different sectors including an option to select 'other' sector or industry provided that the sector they work in was not available in the provided list. The table below shows the distribution of the employment sector or industry in which the study participants or respondents are working in.

Table 3: Employment Distribution of the Sample Population

Employment Sector					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Accountancy, Banking and Finance	10	5.0	5.0	5.0
	Business, Consulting and Management	15	7.4	7.4	12.4

	Charity and Voluntary Work	5	2.5	2.5	14.9
	Creative Arts and Design	4	2.0	2.0	16.8
	Energy and Utilities	10	5.0	5.0	21.8
	Engineering and Manufacturing	31	15.3	15.3	37.1
	Environment and Agriculture	3	1.5	1.5	38.6
	Hair and Beauty	4	2.0	2.0	40.6
	Healthcare	10	5.0	5.0	45.5
	Hospitality and Events Management	2	1.0	1.0	46.5
	Information Technology	9	4.5	4.5	51.0
	Law	3	1.5	1.5	52.5
	Law Enforcement and Security	2	1.0	1.0	53.5
	Leisure, Sport and Tourism	3	1.5	1.5	55.0
	Marketing, Advertising and PR	4	2.0	2.0	56.9
	Media and TV	2	1.0	1.0	57.9
	Other	17	8.4	8.4	66.3
	Pharmaceuticals	3	1.5	1.5	67.8
	Property and Construction	3	1.5	1.5	69.3
	Public Services and Administration	4	2.0	2.0	71.3
	Recruitment and HR	15	7.4	7.4	78.7
	Retail	1	.5	.5	79.2
	Sales	2	1.0	1.0	80.2
	Science and Mathematics	2	1.0	1.0	81.2
	Social Care	4	2.0	2.0	83.2
	Teacher, Training and Education	27	13.4	13.4	96.5
	Transport and Logistics	7	3.5	3.5	100.0
	Total	202	100.0	100.0	

From the analysis outcome presented in the frequency distribution table above, most respondents (31%) work in the engineering and manufacturing sector while a few(0.5% of the respondents)

work in the retail sector. A significant portion of the respondents (13.4%) work in the teacher, training, and education sector while 5% work in the energy and utilities, and healthcare sector respectively. A significant percentage (8.4%) work in other sectors that were not included in the researcher's list of employment sector.

4.1.4 Education Levels of the sample Population

The sample population consisted of individuals with different education level ranging from Bachelor's Degree, Master's Degree, doctorate, to professionals with a given specific qualification. The following table shows the distribution of the education levels of the participants.

Table 4: Education Level Distribution of the Sample Distribution

Educational Level					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	D.E.A. In Sociology	1	.5	.5	.5
	Doctorate	11	5.4	5.4	5.9
	Masters' Degree	98	48.5	48.5	54.5
	Other Professional Qualifications	9	4.5	4.5	58.9
	Postgrad	1	.5	.5	59.4
	Undergraduate Degree	82	40.6	40.6	100.0
	Total	202	100.0	100.0	

The analysis results shows that the education level of most respondents (48.5%) is Master's Degree. A significantly large portion of the respondents (40.6%) have Bachelor's Degree. A significant portion of the respondents (5.4%) were individuals with doctorate degree. A few of the respondents (4.5%) and (0.5%) were individuals with other professional qualification, and

postgraduate education level respectively. Other respondents (0.5%) were individuals with specific professional qualification particularly Differential Education Achievement (DEA) in Sociology.

4.1.5 Job position of the sample population

In addition to the demographical characteristics discussed so far, the sample population also comprised of individuals with different job position at their place of work ranging from junior level, senior level, managerial level, and professional level. The table below shows the frequency distributions of the respondents' job positions.

Table 5: Job Position Distribution of the Sample Distribution

Job Position					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Junior Level	83	41.1	41.1	41.1
	Managerial Level	40	19.8	19.8	60.9
	Professional Level	15	7.4	7.4	68.3
	Senior Level	64	31.7	31.7	100.0
	Total	202	100.0	100.0	

4.2 Test of Reliability and Validity of the Variable Constructs

Due to the multiple nature of the Likert Scale statements in the survey questionnaire, a reliability test was employed to test whether the scale is reliable or unreliable. The reliability test employed by the researcher in this regard was Cronbach Alpha test which measured the reliability

of the survey questionnaire or what is termed as the internal consistency of the variable constructs. The reliability statistics table below shows the outcome of the test.

Table 6: Reliability Statistics

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.944	.949	23

The outcome indicates a Cronbach's Alpha value of 0.944 which implies high reliability level of the survey questionnaire (which is the measurement instrument). The universal rule of thumb (broadly accurate principle) states that a Cronbach's Alpha of at least 0.70 and more is good while a Cronbach's Alpha of 0.80 and above is better, but a Cronbach's Alpha of 0.90 is beyond best or outstanding and superior. Our analysis shows a Cronbach's Alpha of 0.944 which is outstanding and indicates a superior level of internal consistency in relation to any of the sampled population.

Part of Cronbach's Alpha test included determination of the survey questionnaire item that lowers the reliability level of the measurement instrument such that, if the item is deleted, the overall reliability of the instrument would increase significantly. The following Item-Total Statistics table shows the outcome of this analysis.

Table 7: Item-Total Statistics

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted

TC1	83.00	221.244	.628	.661	.941
TC2	83.17	224.492	.604	.613	.942
TC3	83.08	223.397	.632	.697	.941
TC4	83.14	222.259	.696	.734	.941
LMX1	83.28	219.495	.632	.627	.941
LMX2	83.33	216.352	.710	.714	.940
LMX3	83.27	217.590	.652	.592	.941
LMX4	83.23	214.386	.747	.700	.940
LMX5	83.61	217.264	.603	.539	.942
LMX6	83.32	214.289	.759	.776	.939
LMX7	83.16	216.127	.740	.767	.940
KS1	83.11	216.868	.687	.720	.940
KS2	83.12	218.378	.629	.696	.941
KS3	84.65	250.825	-.313	.242	.957
KS4	83.26	217.727	.674	.696	.941
KS5	83.21	216.802	.734	.747	.940
KS6	83.14	217.138	.729	.725	.940
KS7	83.15	216.638	.714	.715	.940
KA1	82.78	217.306	.781	.750	.939
KA2	82.88	217.956	.773	.697	.939
KA3	82.70	220.451	.735	.816	.940
KA4	82.67	219.616	.715	.828	.940
KA5	82.85	217.709	.730	.722	.940

Note:-For the purposes of analysis, the questionnaire items were coded as TC1, TC2, TC2, etc. TC stands for Team Collaboration, LMX is a short form of Leader-Member Exchange, KS stands for Knowledge Sharing, and KA stands for Knowledge Application. The following table expounds on these codes and what they represent.

Table 8: Codes of Variable Constructs and what they represent

Code	The statement it represent
TC1	Employees in my organization are committed to achieving team goals
TC2	Employees in my organization work together as a team to achieve a common goal
TC3	Employees in my organization coordinate team efforts to achieve a common goal
TC4	The collaboration in my team is effective
LMX1	Do you know where you stand with your leader (follower) . . . [and] do you usually know how satisfied your leader (follower) is with what you do?
LMX2	How well does your leader (follower) understand your job problems and needs?
LMX3	How well does your leader (follower) recognize your potential?
LMX4	Regardless of how much formal authority your leader (follower) has built into his or her position, what are the chances that your leader (follower) would use his or her power to help you solve problems in your work?
LMX5	Again, regardless of the amount of formal authority your leader (follower) has, what are the chances that he or she would "bail you out" at his or her expense
LMX6	I have enough confidence in my leader (follower) that I would defend and justify his or her decision if he or she were not present to do so
LMX7	How would you characterize your working relationship with your leader (follower)?
KS1	Members of our team share their special knowledge and expertise with one another
KS2	If a member in our team has some special knowledge about how to perform the team task, he/she will tell other members about it
KS3	There is virtually no exchange of information, knowledge, or sharing of skills among members of the team

KS4	More knowledgeable team members freely provide other members with hard-to-find knowledge or specialized skills.
KS5	Members of our team provide a lot of work-related suggestions to each other
KS6	There is a lot of constructive discussion during team meetings.
KS7	Members in our team provide their experience and knowledge to help other members find solutions to their problems.
KA1	I use the knowledge and skills that my co-workers have shared with me
KA2	I believe that my co-workers use the knowledge and skills I share with them
KA3	I actively use knowledge to solve new problems or to deal with circumstances
KA4	I actively apply knowledge learned from mistakes or experience
KA5	I easily find out sources of knowledge and apply them to problems and challenges

From the Item-Total Statistics Table provided earlier above, the item with the lowest Correlation Item-Total Correlation is KS3 whose Correlation Item-Total Correlation is -0.313. This indicates that KS3 is the item that lowers the reliability and validity of the measurement instrument or the survey questionnaire. If it is deleted, the Cronbach's Alpha value of the measurement instrument becomes 0.957 which is significantly higher than the current Cronbach's Alpha value of 0.944. In other words, deleting item KS3 will increase the internal consistency of the variable constructs with respect to the sampled population. As such, KS3 was overlooked or unconsidered in the subsequent analyses including in testing the hypotheses.

4.3 Multivariate Regression Analysis on Independent and Dependent Variable Constructs

As categorically alluded earlier, the independent variable is Team Collaboration which comprises of four constructs while the dependent variables include Knowledge Sharing and Knowledge Application which comprises of seven and five constructs respectively. Multivariate Regression Analysis was employed to explore the association (if any) between the independent variable constructs and each of the dependent variable constructs. The parameter estimates table below shows the outcome of this analysis.

Table 9: Parameter Estimates

Parameter Estimates							
Dependent Variable	Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
KS1	Intercept	.815	.341	2.391	.018	.143	1.488
	TC1	.238	.108	2.203	.029	.025	.451
	TC2	.042	.118	.358	.720	-.191	.276
	TC3	.307	.133	2.318	.021	.046	.569
	TC4	.192	.131	1.468	.144	-.066	.451
KS2	Intercept	1.322	.368	3.595	.000	.597	2.047
	TC1	.256	.117	2.195	.029	.026	.486
	TC2	-.015	.127	-.119	.905	-.267	.236
	TC3	.141	.143	.988	.325	-.141	.423
	TC4	.265	.141	1.873	.063	-.014	.543
KS3	Intercept	4.274	.483	8.846	.000	3.321	5.227
	TC1	-.112	.153	-.729	.467	-.414	.190
	TC2	-.257	.168	-1.531	.127	-.587	.074
	TC3	-.188	.188	-1.002	.318	-.559	.182

	TC4	.046	.186	.249	.803	-.320	.413
KS4	Intercept	1.147	.354	3.242	.001	.449	1.845
	TC1	.150	.112	1.336	.183	-.071	.371
	TC2	.037	.123	.299	.765	-.205	.279
	TC3	.188	.138	1.363	.174	-.084	.459
	TC4	.285	.136	2.096	.037	.017	.554
KS5	Intercept	.888	.326	2.729	.007	.246	1.530
	TC1	.175	.103	1.698	.091	-.028	.379
	TC2	.196	.113	1.735	.084	-.027	.418
	TC3	.268	.127	2.118	.035	.018	.518
	TC4	.101	.125	.811	.418	-.145	.348
KS6	Intercept	1.385	.342	4.054	.000	.712	2.059
	TC1	.033	.108	.307	.759	-.180	.247
	TC2	.174	.118	1.472	.143	-.059	.408
	TC3	.157	.133	1.184	.238	-.105	.419
	TC4	.269	.131	2.050	.042	.010	.528
KS7	Intercept	1.406	.358	3.923	.000	.699	2.113
	TC1	.174	.114	1.533	.127	-.050	.398
	TC2	.054	.124	.435	.664	-.191	.299
	TC3	.113	.139	.812	.418	-.162	.388
	TC4	.279	.138	2.027	.044	.008	.551
KA1	Intercept	1.285	.282	4.564	.000	.730	1.841
	TC1	.232	.089	2.602	.010	.056	.408
	TC2	.068	.098	.694	.489	-.125	.260
	TC3	-.011	.110	-.096	.924	-.226	.205
	TC4	.460	.108	4.247	.000	.246	.673
KA2	Intercept	1.365	.286	4.771	.000	.800	1.929
	TC1	.173	.091	1.907	.058	-.006	.352
	TC2	.062	.099	.626	.532	-.133	.258
	TC3	.100	.111	.899	.370	-.119	.319

	TC4	.368	.110	3.348	.001	.151	.585
KA3	Intercept	1.711	.264	6.491	.000	1.191	2.231
	TC1	.159	.084	1.904	.058	-.006	.324
	TC2	.147	.091	1.607	.110	-.033	.327
	TC3	.008	.103	.079	.937	-.194	.210
	TC4	.349	.101	3.442	.001	.149	.549
KA4	Intercept	1.776	.285	6.231	.000	1.214	2.338
	TC1	.090	.090	.993	.322	-.088	.268
	TC2	.094	.099	.947	.345	-.101	.289
	TC3	-.113	.111	-1.015	.311	-.331	.106
	TC4	.587	.110	5.357	.000	.371	.803
KA5	Intercept	1.559	.316	4.934	.000	.936	2.182
	TC1	.044	.100	.444	.658	-.153	.242
	TC2	.000	.110	-.003	.998	-.216	.216
	TC3	.035	.123	.284	.777	-.207	.277
	TC4	.586	.121	4.826	.000	.347	.826

The outcome presented in the table above indicates that each of the independent variable construct (represented by TC1, TC2, TC3, and TC4) have some level of effect on each of the construct of the dependent variables. This is evident by the values presented in the B column which comprises of both negative and positive value to indicate that the nature of the effect of the independent variable construct varies. However, the sig. values (also known as p-values) indicates that the relationship between the independent and dependent variable constructs are statistically insignificant since most of the sig. values for each of the independent variable construct is higher than 0.05 (or *p-value* > 0.05 for most of the independent and dependent variable constructs). This is evident in the sig. column where it can be seen that for most of the dependent variable constructs,

the sig. value is greater than 0.05 which is the standard p-value for estimating the statistical significance between independent and dependent variables.

A lower sig. value or *p-value < 0.05* indicates a statistically significant association between the independent variables and dependent variables. This implies that the observed association are highly likely to have occurred exclusively by chance, suggesting a less meaningful association between the constructs of the independent variable (Team Collaboration), and dependent variable (Knowledge Sharing and Knowledge Application).

CHAPTER FIVE

HYPOTHESIS TESTING & RESULTS

5.1 Measurement models

A measurement model was adopted to further explore certain aspects of the variable constructs. The adopted model was Confirmatory Factor Analysis (CFA) which is a Structural Equation Modelling (SEM) used to test whether or not, the observed variables contribute to unobserved or latent variables as well as the conceptual model presented in chapter 1. The structural model developed from the outcome of CFA analysis.

5.1.1 Confirmatory Factor Analysis (CFA) of the Constructs

With the help of IBM SPSS Amos, Confirmatory Factor Analysis (CFA) was performed on the variable constructs to explore how well the observed variables (or the variable constructs of both the independent and dependent variables) contribute to the unobserved variables (also known as latent variable). The outcome of this analysis is presented in the tables below showing the standardized regression weights of the variables.

Table 10: Standardized Regression Weights and Factor Loadings

	Estimate	S.E.	C.R.	P	Label	Factor Loadings	
LMX2 <--- LME	1.000					LMX2 <--- LME	.840
LMX6 <--- LME	1.070	.067	15.984	***	par_1	LMX6 <--- LME	.877
LMX7 <--- LME	1.023	.063	16.198	***	par_2	LMX7 <--- LME	.883
LMX4 <--- LME	1.042	.069	15.018	***	par_3	LMX4 <--- LME	.845

			Estimate	S.E.	C.R.	P	Label				Factor Loadings
LMX1	<---	LME	.863	.069	12.593	***	par_4	LMX1	<---	LME	.754
LMX3	<---	LME	.913	.073	12.506	***	par_5	LMX3	<---	LME	.751
LMX5	<---	LME	.906	.082	10.981	***	par_6	LMX5	<---	LME	.684
KS4	<---	KS	1.000					KS4	<---	KS	.833
KS5	<---	KS	1.022	.065	15.702	***	par_7	KS5	<---	KS	.882
KS7	<---	KS	1.020	.069	14.853	***	par_8	KS7	<---	KS	.852
KS2	<---	KS	.940	.076	12.432	***	par_9	KS2	<---	KS	.758
KS6	<---	KS	.954	.067	14.291	***	par_10	KS6	<---	KS	.831
KS1	<---	KS	.911	.075	12.080	***	par_11	KS1	<---	KS	.743
KA4	<---	KA	1.000					KA4	<---	KA	.905
KA3	<---	KA	.939	.046	20.533	***	par_12	KA3	<---	KA	.909
KA5	<---	KA	1.003	.058	17.232	***	par_13	KA5	<---	KA	.844
KA1	<---	KA	.980	.054	18.025	***	par_14	KA1	<---	KA	.861
KA2	<---	KA	.912	.057	16.131	***	par_15	KA2	<---	KA	.818
TC3	<---	TC	1.000					TC3	<---	TC	.857
TC1	<---	TC	1.096	.077	14.318	***	par_16	TC1	<---	TC	.824
TC2	<---	TC	.893	.067	13.338	***	par_17	TC2	<---	TC	.787
TC4	<---	TC	.990	.064	15.483	***	par_18	TC4	<---	TC	.866

From the above table, the regression weights are presented in the ‘estimate’ column. The symbol, “***” implies that the p-value is less than 0.05(*or p-value < 0.05*). The latent variables or factors

include LME, KS, KA, and TC while their corresponding observed variables include LMX1, LMX2, LMX3, LMX4, LMX5, LMX6, LMX7, KS1, KS2, KS4, KS5, KS6, KS7, KA1, KA2, KA3, KA4, KA5, TC1, TC2, TC3, TC4, respectively. All the observed variables are strongly and positively associated with their respective latent variables, and this is evident by the high regression weights of each association between the latent and observable variables (as shown in the above table). Additionally, all the factor loadings (which are standardized regression weights) are above the typically recommended value of 0.7, indicating a strong relationship between the latent and observable variables. Furthermore, all the p-values are less than 0.05, *p-value < 0.05* (as indicated by '***') evincing a strong association between the latent and observable variables. The subsequent subchapter presents the developed structural model of the latent and observable variables.

5.1.2 Structural Model of the Variable Constructs

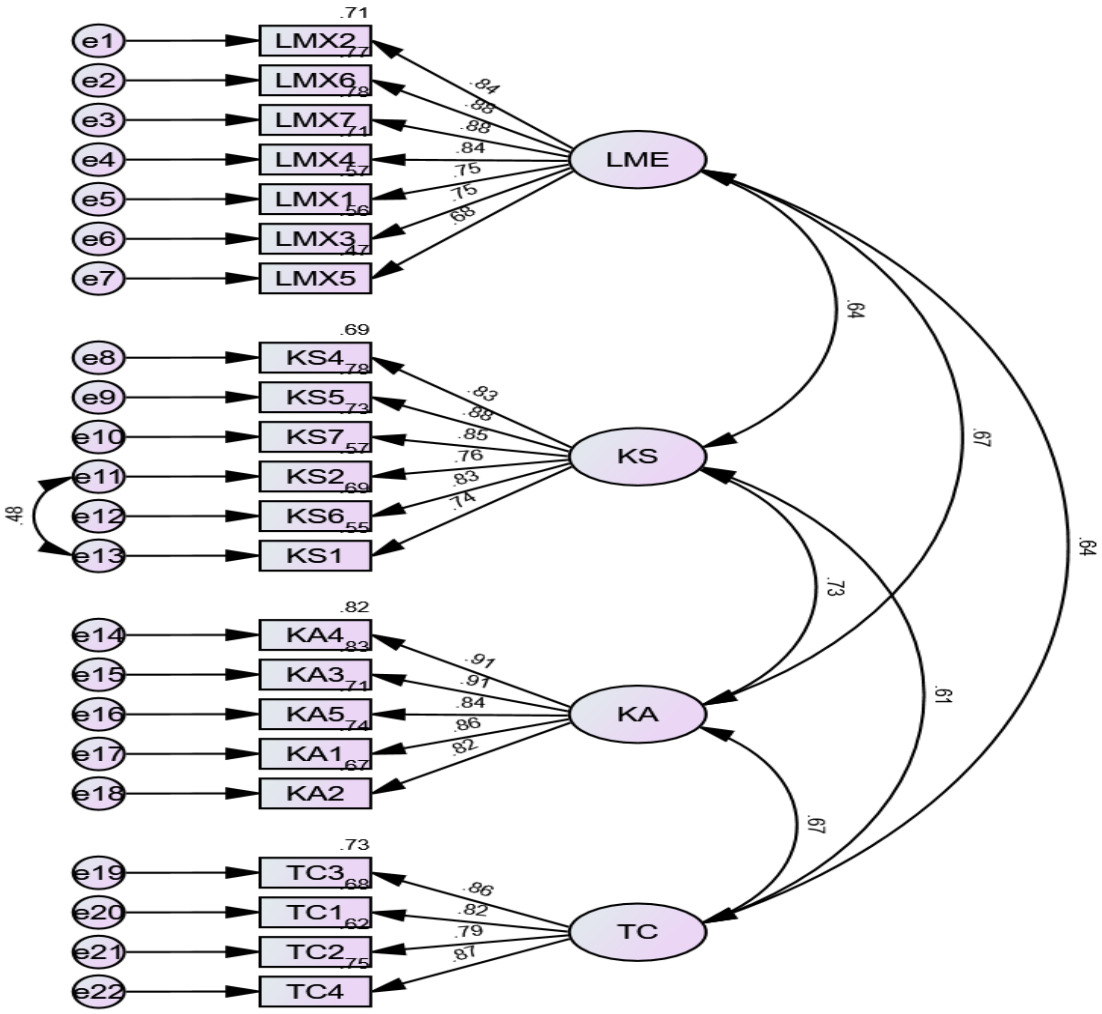

Figure 2: Structural Model of the Variable Constructs

5.1.2.1 Reliability and Validity of the Structural Model

The reliability and validity of the above developed structural model was assessed as an extension or phase of the CFA. The key criteria involved in this assessment included Composite Reliability (CR), Average Variance Extracted (AVE), Maximum Shared Variance (MSV), and Maximum Variance Extracted (MaxR (H)). The results indicates no concerns with reliability and validity of the model. The table below shows the results of the analysis.

Table 11: Reliability and Validity of the Model

	CR	AVE	MSV	MaxR(H)	LME	KS	KA	TC
LME	0.929	0.653	0.448	0.938	**0.808**			
KS	0.927	0.678	0.545	0.930	0.634***	**0.824**		
KA	0.939	0.754	0.545	0.943	0.670***	0.738***	**0.868**	
TC	0.901	0.696	0.444	0.905	0.641***	0.620***	0.666***	**0.834**

As seen in the results presented in the table above, all Composite Reliability (CR) values are relatively high ranging from 0.901 to 0.939 suggesting good internal consistency for each of the latent factors. AVE values indicate better convergent validity. Higher AVE values indicate good convergent validity for every latent variables or factors. From the table above, the AVE values are comparatively high ranging from 0.653 to 0.754, implying good convergent validity for each latent variable. MSV measures discriminant validity. Lower MSV values suggest better discriminant validity, indicating that each latent factor is distinct from the others. From the analysis outcome presented in the above table, all MSV values are relatively low, ranging from 0.444 to 0.545, suggesting an acceptable discriminant validity. The convergent validity of the model is also assessed by MaxR (H). A high MaxR (H)) value indicates good convergent validity. From the results presented above, all MaxR (H) values are relatively high and ranges from 0.905 to 0.943. This indicates a good convergent validity. Additionally, there exists some statistically significant

correlation between the latent factors as evident by the symbol,"***". For instance, KS and KA have a correlation of 0.738 while KS and TC have a correlation of 0.62, suggesting significant relationships or interrelatedness between the latent factors.

5.2 Test of Hypotheses

As mentioned in chapter one, the primary intention of this study was to explore the association between Team Collaboration (as the independent variable), and Knowledge Sharing and Knowledge Application (as the dependent variables). In addition, the study investigates the moderating effect of Leader-Member Exchange (as the moderating variable) on the relationship between the independent and dependent variable. The moderating analysis performed earlier using MGLM suggest that there is a significant effect of the moderating variable on the relationship between the independent variable and the dependent variables. However, the magnitude and nature of this effect is still unknown, and hence in this subsection, the second and third hypotheses outlined in chapter one is tested to reveal whether or not, highly effective Leader-Member Exchange strengthens or weakens the association between Team Collaboration, and Knowledge Sharing, and Team Collaboration and Knowledge Application. The CFA performed earlier has enabled establishment of a well-fitting model, revealing existence of a strong association between the unobservable or latent variables, and observable variables. As such, the first and second hypotheses can now be tested using an appropriate statistic.

5.2.1 Test of Hypothesis First and Second

H_1: Team Collaboration is Positively Linked to Knowledge Sharing

This hypothesis suggests that Team Collaboration Positively Relates with Knowledge. To test this hypothesis, Pearson Correlation Statistic was performed on Team Collaboration and Knowledge Sharing variables. The outcome of this test is shown in the table below.

Table 12: Person's Correlation Outcome-Team Collaboration and Knowledge Sharing

Correlations

		TC1	TC2	TC3	TC4	KS1	KS2	KS3	KS4	KS5	KS6	KS7
TC1	Pearson Correlation	1	.656**	.740**	.680**	.503**	.428**	-.250**	.411**	.481**	.365**	.396**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	202	202	202	202	202	202	202	202	202	202	202
TC2	Pearson Correlation	.656**	1	.653**	.694**	.424**	.341**	-.266**	.365**	.461**	.395**	.352**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	202	202	202	202	202	202	202	202	202	202	202
TC3	Pearson Correlation	.740**	.653**	1	.746**	.520**	.411**	-.258**	.429**	.501**	.405**	.393**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000
	N	202	202	202	202	202	202	202	202	202	202	202
TC4	Pearson Correlation	.680**	.694**	.746**	1	.485**	.420**	-.222**	.440**	.462**	.431**	.417**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.001	.000	.000	.000	.000
	N	202	202	202	202	202	202	202	202	202	202	202
KS1	Pearson Correlation	.503**	.424**	.520**	.485**	1	.771**	-.429**	.607**	.669**	.577**	.606**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000
	N	202	202	202	202	202	202	202	202	202	202	202
KS2	Pearson Correlation	.428**	.341**	.411**	.420**	.771**	1	-.295**	.682**	.678**	.601**	.615**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000
	N	202	202	202	202	202	202	202	202	202	202	202
KS3	Pearson Correlation	-.250**	-.266**	-.258**	-.222**	-.429**	-.295**	1	-.194**	-.285**	-.223**	-.263**
	Sig. (2-tailed)	.000	.000	.000	.001	.000	.000		.006	.000	.001	.000
	N	202	202	202	202	202	202	202	202	202	202	202
KS4	Pearson Correlation	.411**	.365**	.429**	.440**	.607**	.682**	-.194**	1	.753**	.649**	.730**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.006		.000	.000	.000
	N	202	202	202	202	202	202	202	202	202	202	202

KS5	Pearson Correlation	.481**	.461**	.501**	.462**	.669**	.678**	-.285**	.753**	1	.732**	.729**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000
	N	202	202	202	202	202	202	202	202	202	202	202
KS6	Pearson Correlation	.365**	.395**	.405**	.431**	.577**	.601**	-.223**	.649**	.732**	1	.756**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.001	.000	.000		.000
	N	202	202	202	202	202	202	202	202	202	202	202
KS7	Pearson Correlation	.396**	.352**	.393**	.417**	.606**	.615**	-.263**	.730**	.729**	.756**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
	N	202	202	202	202	202	202	202	202	202	202	202

**. Correlation is significant at the 0.01 level (2-tailed).

From the outcome of the analysis presented in the correlation table above, Team Collaboration Constructs and Knowledge Sharing constructs have a statistically significant linear relationship ($r = 0.396$, $p < 0.01$). However, the KS3 construct reveals some degree of negative association between the constructs of these variables, but as mentioned earlier in the chapter, under the reliability test using Cronbach's Alpha test, KS3 has been unconsidered in the outcome of this analysis. The direction of this relationship is positive and this is evident by the positive Pearson's correlation values which are positive. The strength or magnitude of the relationship is relatively moderate since the absolute value of Pearson's Correlation(r) considered (which is 0.396) lies between 0.3 and 0.5(or $0.3 < |r| < 0.5$). Therefore, we accept the hypothesis that Team Collaboration is Positively Linked to Knowledge Sharing. However, strength of this association is moderate.

H_2: Team Collaboration is Positively Linked to Knowledge Application

Similar to the previous test, Pearson's Correlation test was also employed in testing this hypothesis. The outcome of the analysis is presented in the correlation table below.

Table 13: Person's Correlation Outcome-Team Collaboration and Knowledge Application

Correlations									
		TC1	TC2	TC3	TC4	KA1	KA2	KA3	KA4	KA5
TC1	Pearson Correlation	1	.656**	.740**	.680**	.535**	.500**	.499**	.426**	.394**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000	.000
	N	202	202	202	202	202	202	202	202	202
TC2	Pearson Correlation	.656**	1	.653**	.694**	.481**	.455**	.490**	.439**	.383**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.000	.000
	N	202	202	202	202	202	202	202	202	202
TC3	Pearson Correlation	.740**	.653**	1	.746**	.498**	.499**	.477**	.410**	.422**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000	.000
	N	202	202	202	202	202	202	202	202	202
TC4	Pearson Correlation	.680**	.694**	.746**	1	.590**	.550**	.554**	.566**	.535**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000	.000	.000
	N	202	202	202	202	202	202	202	202	202
KA1	Pearson Correlation	.535**	.481**	.498**	.590**	1	.765**	.771**	.756**	.695**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.000	.000
	N	202	202	202	202	202	202	202	202	202
KA2	Pearson Correlation	.500**	.455**	.499**	.550**	.765**	1	.711**	.698**	.688**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000	.000	.000
	N	202	202	202	202	202	202	202	202	202
KA3	Pearson Correlation	.499**	.490**	.477**	.554**	.771**	.711**	1	.866**	.760**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.000	.000
	N	202	202	202	202	202	202	202	202	202
KA4	Pearson Correlation	.426**	.439**	.410**	.566**	.756**	.698**	.866**	1	.792**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000		.000
	N	202	202	202	202	202	202	202	202	202
KA5	Pearson Correlation	.394**	.383**	.422**	.535**	.695**	.688**	.760**	.792**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	
	N	202	202	202	202	202	202	202	202	202

**. Correlation is significant at the 0.01 level (2-tailed).

From the outcome presented in the table above, Team Collaboration (TC) Constructs and Knowledge Application (KA) constructs have a statistically significant relationship (with r = 0.394, p-value < 0.01). The direction of this relationship is positive as evident by the positive Pearson's Correlation values for the different pairs of variables constructs. The strength of the relationship is relatively moderate as r = 0.394 lies between r = 0.3 and r = 0.5(or $0.3 < |r| < 0.5$). As such, we accept the hypothesis that Team Collaborating is Positively Linked to Knowledge Application. Nevertheless, the magnitude of this association is moderate.

5.2.2 Test of Third and Fourth Hypothesis

H_3: LMX moderates the effect of Team Collaboration on Knowledge Sharing such that a higher quality LMX translates to a strong association between Team Collaboration and Knowledge Sharing

H_4: LMX moderates the effect of Team Collaboration on Knowledge Application such that a higher quality LMX translates to a strong association between Team Collaboration and Knowledge Application

To test the above hypothesis, a generalized regression model was performed on the constructs of moderating variable (LMX) with respect to the relationship between the constructs of the dependent variable (Knowledge Sharing and Knowledge Application), and the independent variable (Team Collaboration). The outcome of the analysis is given in the Multivariate Test table shown below.

Table 14: Multivariate Tests

Multivariate Tests[a]							
Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.647	20.624[b]	12.000	135.000	.000	.647
	Wilks' Lambda	.353	20.624[b]	12.000	135.000	.000	.647
	Hotelling's Trace	1.833	20.624[b]	12.000	135.000	.000	.647
	Roy's Largest Root	1.833	20.624[b]	12.000	135.000	.000	.647
LMX1	Pillai's Trace	.111	1.410[b]	12.000	135.000	.169	.111
	Wilks' Lambda	.889	1.410[b]	12.000	135.000	.169	.111
	Hotelling's Trace	.125	1.410[b]	12.000	135.000	.169	.111
	Roy's Largest Root	.125	1.410[b]	12.000	135.000	.169	.111
LMX2	Pillai's Trace	.138	1.798[b]	12.000	135.000	.054	.138
	Wilks' Lambda	.862	1.798[b]	12.000	135.000	.054	.138
	Hotelling's Trace	.160	1.798[b]	12.000	135.000	.054	.138
	Roy's Largest Root	.160	1.798[b]	12.000	135.000	.054	.138
LMX3	Pillai's Trace	.088	1.088[b]	12.000	135.000	.375	.088
	Wilks' Lambda	.912	1.088[b]	12.000	135.000	.375	.088
	Hotelling's Trace	.097	1.088[b]	12.000	135.000	.375	.088
	Roy's Largest Root	.097	1.088[b]	12.000	135.000	.375	.088
LMX4	Pillai's Trace	.157	2.091[b]	12.000	135.000	.021	.157
	Wilks' Lambda	.843	2.091[b]	12.000	135.000	.021	.157
	Hotelling's Trace	.186	2.091[b]	12.000	135.000	.021	.157
	Roy's Largest Root	.186	2.091[b]	12.000	135.000	.021	.157
LMX5	Pillai's Trace	.176	2.395[b]	12.000	135.000	.008	.176
	Wilks' Lambda	.824	2.395[b]	12.000	135.000	.008	.176
	Hotelling's Trace	.213	2.395[b]	12.000	135.000	.008	.176
	Roy's Largest Root	.213	2.395[b]	12.000	135.000	.008	.176
LMX6	Pillai's Trace	.092	1.145[b]	12.000	135.000	.330	.092
	Wilks' Lambda	.908	1.145[b]	12.000	135.000	.330	.092
	Hotelling's Trace	.102	1.145[b]	12.000	135.000	.330	.092
	Roy's Largest Root	.102	1.145[b]	12.000	135.000	.330	.092
	Wilks' Lambda	.913	1.074[b]	12.000	135.000	.387	.087

	Hotelling's Trace	.095	1.074[b]	12.000	135.000	.387	.087
	Roy's Largest Root	.095	1.074[b]	12.000	135.000	.387	.087

a. Design: Intercept + LMX1 + LMX2 + LMX3 + LMX4 + LMX5 + LMX6 + LMX7

b. Exact statistic

c. The statistic is an upper bound on F that yields a lower bound on the significance level.

The Person's Correlation Test performed earlier has established that Team Collaboration positively relates with Knowledge Sharing and Knowledge Application, respectively. The outcome of generalized regression model presented in the above table generally indicates a mixture of results regarding the moderating effect of LMX on the relationship between Team Collaboration and Knowledge Sharing as well as Knowledge Application especially for different LMX constructs. A cross all of the statistics presented in the table, a *p-value* < 0.05 should indicate a moderating effect of the moderating variable (LMX) on the association between the independent variable and dependent variables.

However, from the analysis outcome, LMX1, LMX2, LMX3, LMX6, and LMX7 constructs, have *a p-value* > 0.05 which indicates that there is no moderating effect of these constructs on the association between Team Collaboration Constructs, and the Knowledge Sharing Constructs, and Knowledge Application Constructs, respectively. Hence, the only constructs of the moderating variable (LMX) with a moderating effect on the association between TC and KS, and TC and KA are LMX4, and LMX5. Therefore, the third and fourth hypotheses are largely untrue. In other words, LMX does not significantly moderates the effect of Team Collaboration on Knowledge Sharing, and Knowledge Application, respectively.

CHAPTER SIX

DISCUSSION, RECOMMENDATION, AND CONCULISON

6.1 Discussion and implications of the results

This study was set to explore the relationship between Team Collaboration and Knowledge Sharing, and Team Collaboration and Knowledge Application. And the moderating effect of Leader-Member Exchange on the relationship between Team Collaboration and Knowledge Sharing, and Team Collaboration and Knowledge Application. The findings of the analysis undertaken in the preceding chapter indicates that Team Collaboration positively associates with Knowledge Sharing, and Knowledge Application. However, Leader-Member Exchange has been found to have no significant effect on these relationships. The first findings indicating a positive relationship between Team Collaboration and Knowledge Sharing is in line with various discussions in literature regarding Team Collaboration and Knowledge Sharing. Team Collaboration involves a collective effort by employees aimed at pursuing a common goal at a team or organizational level. It is characterized by different individuals or employees with diverse backgrounds working together in a team by bringing their distinctive skills and expertise to a collective pool with an objective of achieving a common objective.

Wolfe & Shepherd (2015) point out that employees are highly likely to collaborate when working in a team with an objective of achieving a shared goal. Such collaborations typically forms an avenue for knowledge exchange among employees working within a team to achieve a common goal. Nevertheless, Laursen & Foss (2003) emphasize that Team Collaboration that nurtures and

encourages knowledge exchange or knowledge sharing activities amongst employees working in a team towards a common goal can mainly be achieved with the existence of mutual respect, high level of trust, and open communication among team members. The implication of the outcome regarding Team Collaboration and Knowledge Sharing particularly to organization is that effective team collaboration has the potential of enabling employees to highly embrace sharing knowledge, expertise, and experiences with each other, and this can lead to improved learning within the organization as well as enhances the overall knowledge base of the organization. Additionally, effective team collaboration promotes exchange of ideas and perspectives which increases innovation and creativity within the organization.

Team collaboration has also been established to positively relate with knowledge application. This finding is in line with various discussions on knowledge management in literature. Ouakouak & Ouedraogo (2019) highlight that knowledge application is crucial in enhancing organizational efficiency, and sharing knowledge alone is insufficient if organizational efficiency is to be realized. Once employees acquire knowledge through various means including knowledge sharing means, they should embrace finding ways on how to implement or apply the knowledge in improving the effectiveness of the organization's performance. One way that employees can apply knowledge is solving problems. Alavi & Leidner (2001) point out that application of shared knowledge in problem solving leads to the realization of its value. Employees working in teams can encircle using knowledge gained through sharing or other means to solve problems that they encounter at the team level which hinders them from achieving the common goal. The fundamental implication of this finding to organization that organizational effectives can be enhanced through team collaboration and knowledge application. Employees working in teams can leverage their collective knowledge and problem solving abilities to improve organizational performance and

efficiency. Moreover, knowledge utilization can lead to value creation since knowledge is a valuable asset to an organization, but the actual value can mainly be realized when knowledge is applied and effectively utilized.

The last findings reveals that Leader-Member Exchange does not have any moderating (strengthening or weakening) effect on the positive relationship between Team Collaboration and Knowledge Sharing, and Knowledge Application. Leader-Member Exchange theory suggests that a good leader-member relationship results in mutuality from the member (Kuvaas, Buch, Dysvik, & Haerem, 2012). In other words, when leaders and their subordinates or followers have a healthy or high quality relationship, the followers will likely reciprocate by working extra hard or putting extra effort in their typical roles at work (Dansereau, Graen, & Haga, 1975). However, unhealthy leader-member relationship triggers poor performance behaviour from the members. Illies, Nahragang, & Morgeson (2017) point out that every distinctive leader-member exchange provokes distinctive reaction from the member or follower which are sometimes expressed inform of attitude, and job performance.

While various prior studies agree that the quality of leader-member relationship has a bearing on employee or follower's behaviour and attitude towards their role, the findings of this study indicates that the quality of leader-member exchange does not have a bearing or effect on the relationship between Team Collaboration and Knowledge Sharing, and Knowledge Application. This implies that the nature and quality of association between leaders and their followers does not have any effect on how the follower collaborates with colleagues in a teamwork. This contradicts a suggestion by Wang, Chin, & Lin (2020) who pointed out that employees having healthy relationship with their leaders, characterized by trust, respect and mutual obligation are more likely to engage in knowledge sharing behaviour. It also gainsays suggestion by Cha, Kim, Lee, &

Bachrach (2015), that health leader-member exchange pertaining to exhibition of transformational leadership behaviour by leaders positively impacts members to apply knowledge at a team-level. The implication of this finding is that organizations should put a greater emphasis on fostering a culture of collaboration and knowledge sharing within teams regardless of the quality of leader-member relationships. Organizations should also consider revisiting leadership development and training and this is because, in spite of the outcome of this study, the importance of effective leadership is not negated by the finding. As such, organizations should continue to invest in leadership development programs to equip leaders with the essential skills that enables them to promote teamwork, and support collaboration as well as knowledge sharing and application within their teams.

6.2 Limitations of the study

The target population for this study were individuals working and living in the Middle Eastern and North Africa region (MENA). However, data was collected beyond this geographical region which implies that the sample population is potentially not a representative of the target population. Hence the findings of this study cannot be applicably generalized to the targeted population. This was the fundamental limitation to this study. Additionally, the sample size (N=202) is relatively small and this limits the study findings as it might not have provided sufficient statistical power to detect meaningful effects on the relationship between the variables. For instance, the moderating effect of the moderator variable (leader-member exchange), and the relationship between team collaboration, and the dependent variables (knowledge sharing and knowledge application).

6.3 Suggestions for future studies

Future studies on this subject should consider using much larger sample size (of at least 500 sample population size) that is focused on the geographical context of the research to not just avoid discrepancies associated with generalizability of the findings, but to augment the findings' generalizability. Future research should also consider undertaking multiple levels of analysis which will enable exploring the associations between Team Collaboration, Knowledge Sharing, Knowledge Application, and Leader-Member Exchange at different levels of analysis such as individual, team, and organizational level. This would provide a more nuanced understanding of how the studied constructs interact and influence the outcomes at various levels.

6.4 Managerial Implications

Based on the findings of this study, organizations and other relevant entities should actively promote and nurture a collaborative culture where teamwork, knowledge sharing, and collaboration are encouraged and valued. This can be achieved through establishing recognition and reward schemes, and team work norms and expectations. Organizations should also provide or create platforms and prospects that enables knowledge sharing. This can include internal knowledge-sharing platforms, cross-functional team meetings, and facilitation of practices where employees can exchange idea and expertise. Lastly, leaders should model and exhibit collaborative behaviours by themselves via active participation in collaborative efforts, knowledge sharing activities, and promotion of culture of collaboration.

6.5 Conclusion

The central interest of this study was to investigate the relationship between Team Collaboration and Knowledge Sharing, and Team Collaboration and Knowledge Application. In addition, this study was also interested in exploring the moderating effect of Leader-Member Exchange on the relationship between Team Collaboration and Knowledge Sharing, and Knowledge Application, respectively. Based on the findings of this study, Team Collaboration positively associates with Knowledge Sharing, and Knowledge Application. This implies that when team members collaborate effectively, it promotes the sharing of knowledge among team members, and facilitates the application of that knowledge to address challenges and problems as well as improve performance. The findings also indicate that the quality of Leader-Member Exchange does not have a direct moderating effect on the relationship between Team Collaboration and Knowledge Sharing as well as Knowledge Application. This suggests that the nature and quality of the relationship between leaders and followers may not influence the collaborative behaviours and knowledge-related activities within teams.

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APPENDIX

APPENDIX A: SURVEY

I would like to invite you to participate in a research project by completing the following questionnaire/ survey. I am a student at the Lebanese American University and I am completing this research project as part of my MSc in Human Resource Management. The purpose of this questionnaire / survey aims to understand the relationship between knowledge sharing and knowledge application in the workplace, and the impact of leader-subordinate relationship and team collaboration on this model.
There are no known risks, harms or discomforts associated with this study beyond those encountered in normal daily life. The information you provide will be used to enhance and improve the current literature of the aforementioned variables. You will not directly benefit from participation in this study. The study will involve 250 participants. Completing the survey will take 5 -7 minutes of your time.
By continuing with the questionnaire / survey, you agree with the following statements:
1. I have been given sufficient information about this research project.
2. I understand that my answers will not be released to anyone and my identity will remain anonymous. My name will not be written on the questionnaire nor be kept in any other records.
3. When the results of the study are reported, I will not be identified by name or any other information that could be used to infer my identity. Only researchers will have access to view any data collected during this research however data cannot be linked to me.
4. I understand that I may withdraw from this research any time I wish and that I have the right to skip any question I don't want to answer.
5. I understand that my refusal to participate will not result in any penalty or loss of benefits to which I otherwise am entitled to.
6. I have been informed that the research abides by all commonly acknowledged ethical codes and that the research project has been reviewed and approved by the Institutional Review Board at the Lebanese American University

7. I understand that if I have any additional questions, I can ask the research team listed below
8. I have read and understood all statements on this form.
9. I voluntarily agree to take part in this research project by completing the following survey/Questionnaire / survey aims to understand the relationship between knowledge sharing and knowledge application in the workplace, and the impact of leader-subordinate relationship and team collaboration on this model
For any further questions, kindly contact:
Hady Makhlouf
Hady.makhlouf@hotmail.com
00961-3022331
If you have any questions about your rights as a participant in this study, or you want to talk to someone outside the research, please contact the:
Institutional Review Board Office,
Lebanese American University
3rd Floor, Dorm A, Byblos Campus
Tel: 00 961 1 786456 ext. (2546) irb@lau.edu.lb
This study has been reviewed and approved by the LAU IRB:

For each statement, indicate how interested you: where 1 means Strongly Disagree (SD), 2 Disagree (D), 3 Undecided (N), 4 Agree (A) and 5 means Strongly Agree (SA):

		SD	D	N	A	SA
TC1	Employees in my organization are committed to achieving team goals					
TC2	Employees in my organization work together as a team to achieve a common goal					

TC3	Employees in my organization coordinate team efforts to achieve a common goal					
TC4	The collaboration in my team is effective					
LMX1	Do you know where you stand with your leader (follower) . . .[and] do you usually know how satisfied your leader (follower) is with what you do?					
LMX2	How well does your leader (follower) understand your job problems and needs?					
LMX3	How well does your leader (follower) recognize your potential?					
LMX4	Regardless of how much formal authority your leader (follower) has built into his or her position, what are the chances that your leader (follower) would use his or her power to help you solve problems in your work?					
LMX5	Again, regardless of the amount of formal authority your leader (follower) has, what are the chances that he or she would "bail you out" at his or her expense					
LMX6	I have enough confidence in my leader (follower) that I would defend and justify his or her decision if he or she were not present to do so					
LMX7	How would you characterize your working relationship with your leader (follower)?					
KS1:	Members of our team share their special knowledge and expertise with one another					
KS2:	If a member in our team has some special knowledge about how to perform the team task, he/she will tell other members about it					
KS3:	There is virtually no exchange of information, knowledge, or sharing of skills among members of the team					
KS4:	More knowledgeable team members freely provide other members with hard-to-find knowledge or specialized skills.					
KS5:	Members of our team provide a lot of work-related suggestions to each other					
KS6:	There is a lot of constructive discussion during team meetings.					
KS7:	Members in our team provide their experience and knowledge to help other members find solutions to their problems.					
KA1	I use the knowledge and skills that my coworkers have shared with me					
KA2	I believe that my coworkers use the knowledge and skills I share with them					

KA3	I actively use knowledge to solve new problems or to deal with circumstances					
KA4	I actively apply knowledge learned from mistakes or experience					
KA5	I easily find out sources of knowledge and apply them to problems and challenges					

Q25: Gender
☐ Male
☐ Female

Q26: Age: …….
Q27: Employment Sector: …….

Q28: Position currently hold:
☐ Junior Level
☐ Senior Level
☐ Managerial Level
☐ Professional Level

Q29: Educational Level:
☐ Undergraduate Degree
☐ Masters' degree
☐ Doctorate
Other professional qualifications, (please specify) ----------

Q30: Marital Status
☐ Single
☐ Married, No Children
☐ Married, With Children
☐ Divorced
☐ Separated

APPENDIX B: IRB APPROVAL OF RESEARCH

LAU
الجامعة اللبنانية الأميركية
Lebanese American University

Institutional Review Board (IRB)
لجنة الأخلاقيات

NOTICE OF IRB EXEMPTION DETERMINATION

To: Mr. Hady Makhlouf
Dr. Hussein Ismail
Assistant Professor
School of Business

NOTICE ISSUED: 16 February 2023
EXPIRATION DATE: 16 February 2025
REVIEW TYPE: EXEMPT CATEGORY B

Date: February 16, 2023
RE: ***IRB #:*** *LAU.SOB.HI4.16/Feb/2023*
Protocol Title: *The Role of Leader-Member Exchange (LMX) and Team Collaboration on Knowledge Sharing and Knowledge Application*

Your application for the above referenced research project has been reviewed by the Lebanese American University, Institutional Review Board (LAU IRB). This research project qualifies as exempt under the category noted in the Review Type

This notice is limited to the activities described in the Protocol Exempt Application and all submitted documents listed on page 2 of this letter. **Final reviewed consent documents or recruitment materials and data collection tools released with this notice are part of this determination and must be used in this research project.**

CONDITIONS FOR ALL LAU NOTICE OF IRB EXEMPTION DETERMINATION

LAU RESEARCH POLICIES & PROCEDURES: *All individuals engaged in the research project must adhere to the approved protocol and all applicable LAU IRB Research Policies & Procedures. PARTICIPANTS must NOT be involved in any research related activity prior to IRB notice date or after the expiration date.*

EXEMPT CATEGORIES: *Activities that are exempt from IRB review are not exempt from IRB ethical review and the necessity for ethical conduct.*

PROTOCOL EXPIRATION: PROTOCOL EXPIRATION: *The LAU IRB notice expiry date for studies that fall under Exemption is 2 years after this notice, as noted above. If the study will continue beyond this date, a request for an extension must be submitted at least 2 weeks prior to the Expiry date.*

MODIFICATIONS AND AMENDMENTS: *Certain changes may change the review criteria and disqualify the research from exemption status; therefore, any proposed changes to the previously IRB reviewed exempt study must be reviewed and cleared by the IRB before implementation.*

RETENTION: *Study files must be retained for a period of 3 years from the date of project completion.*

IN THE EVENT OF NON-COMPLIANCE WITH ABOVE CONDITIONS, THE PRINCIPAL INVESTIGATOR SHOULD MEET WITH THE REPRESENTATIVES OF THE IRB OFFICE IN ORDER TO RESOLVE SUCH CONDITIONS. IRB CLEARANCE CANNOT BE GRANTED UNTIL NON-COMPLIANT ISSUES HAVE BEEN RESOLVED.

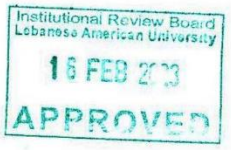
If you have any questions concerning this information, please contact the IRB office by email at irb@lau.edu.lb

The IRB operates in compliance with the national regulations pertaining to research under the Lebanese Minister of Public Health's Decision No.141 dated 27/1/2016 under LAU IRB Authorization reference 2016/3708, the international guidelines for Good Clinical Practice, the US Office of Human Research Protection (45CFR46) and the Food and Drug Administration (21CFR56). LAU IRB U.S. Identifier as an international institution: FWA00014723 and IRB Registration # IRB00006954 LAUIRB#1

Dr. Joseph Stephan
Chair, Institutional Review Board

DOCUMENTS SUBMITTED:

LAU IRB Exempt Application	Received 7 February 2023
Research Proposal	Received 7 February 2023
Informed Consent	Received 7 February 2023
Questionnaire	Received 7 February 2023
Link to online survey	Received 7 February 2023
CITI Training – Hussein Ismail	Cert.# 39890420 Dated (4 December 2020)
CITI Training – Hady Makhlouf	Cert.# 49766724 Dated (29 June 2022)



LAU
الجامعة اللبنانية الأميركية
Lebanese American University

Institutional Review Board (IRB)
لجنة الأخلاقيات

NOTICE OF IRB EXEMPTION DETERMINATION

To: Mr. Hady Makhlouf
Dr. Hussein Ismail
Assistant Professor
School of Business

NOTICE ISSUED: 16 February 2023
EXPIRATION DATE: 16 February 2025
REVIEW TYPE: EXEMPT - AMENDMENT

Date: June 15, 2023
RE: ***IRB #:*** *LAU.SOB.HI4.16/Feb/2023*
Protocol Title: *The Role of Leader-Member Exchange (LMX) and Team Collaboration on Knowledge Sharing and Knowledge Application*

Your amendment to the above referenced research project has been approved by the Lebanese American University, Institutional Review Board (LAU IRB).

This approval is limited to the activities described in the Protocol Exempt Application and all submitted documents listed on page 2 of this letter. **Final reviewed consent documents or recruitment materials and data collection tools released with this notice are part of this determination and must be used in this research project.**

CONDITIONS FOR ALL LAU NOTICE OF IRB EXEMPTION DETERMINATION

LAU RESEARCH POLICIES & PROCEDURES: *All individuals engaged in the research project must adhere to the approved protocol and all applicable LAU IRB Research Policies & Procedures. PARTICIPANTS must NOT be involved in any research related activity prior to IRB notice date or after the expiration date.*

EXEMPT CATEGORIES: *Activities that are exempt from IRB review are not exempt from IRB ethical review and the necessity for ethical conduct.*

PROTOCOL EXPIRATION: PROTOCOL EXPIRATION: *The LAU IRB notice expiry date for studies that fall under Exemption is 2 years after this notice, as noted above. If the study will continue beyond this date, a request for an extension must be submitted at least 2 weeks prior to the Expiry date.*

MODIFICATIONS AND AMENDMENTS: *Certain changes may change the review criteria and disqualify the research from exemption status; therefore, any proposed changes to the previously IRB reviewed exempt study must be reviewed and cleared by the IRB before implementation.*

RETENTION: *Study files must be retained for a period of 3 years from the date of project completion.*

IN THE EVENT OF NON-COMPLIANCE WITH ABOVE CONDITIONS, THE PRINCIPAL INVESTIGATOR SHOULD MEET WITH THE REPRESENTATIVES OF THE IRB OFFICE IN ORDER TO RESOLVE SUCH CONDITIONS. IRB CLEARANCE CANNOT BE GRANTED UNTIL NON-COMPLIANT ISSUES HAVE BEEN RESOLVED.

If you have any questions concerning this information, please contact the IRB office by email at irb@lau.edu.lb

The IRB operates in compliance with the national regulations pertaining to research under the Lebanese Minister of Public Health's Decision No.141 dated 27/1/2016 under LAU IRB Authorization reference 2016/3708, the international guidelines for Good Clinical Practice, the US Office of Human Research Protection (45CFR46) and the Food and Drug Administration (21CFR56). LAU IRB U.S. Identifier as an international institution: FWA00014723 and IRB Registration # IRB00006954 LAUIRB#1

Dr. Joseph Stephan
Chair, Institutional Review Board

DOCUMENTS SUBMITTED:

LAU IRB Protocol Amendment Application	Received 30 May 2023
Amended Questionnaire	Received 30 May 2023
Link to online survey – Amended	Received 30 May 2023