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Quantifying Global Virtual Teams' (GVTs) Performance Variability

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Master's Thesis

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This thesis delves into the complex relationship between individual factors and the performance of global virtual teams' (GVTs), aiming to uncover what influences their performance in today's virtual work environment. Through detailed analysis, it identifies key determinants of performance variability in global virtual teams' (GVTs), including team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture. The positive associations between these variables and the performance of global virtual teams' (GVTs) highlight the importance of team dynamics, emphasizing the necessity for empirically-supported practices, decision-making, and strategic actions.

Key approaches for enhancing global virtual teams' (GVTs) performance include cultivating a culture of continuous learning, understanding emotional dynamics, building trust, encouraging creativity, and nurturing collaboration. Despite these strategies, challenges like cultural differences and technological limitations require proactive measures and infrastructure investments. By focusing on evidence-based practices and professional development, organizations can enable global virtual teams' (GVTs) to excel in a globally connected marketplace, fostering innovation, and maintaining a competitive edge. This synthesis provides guidance for managing global virtual teams' (GVTs) dynamics, informing strategic decisions to boost team performance and achieve organizational objectives in virtual collaboration settings.

Key Words: Global Virtual Teams' (GVTs), Global Virtual Teams' (GVTs) Performance, Global Virtual Teams' (GVTs) Performance Variability, Team Learning Behaviors, Emotional Intelligence, Trust, Team Creativity, Collaborative Culture.

मास्टर की थीसिस

मास्टर की थीसिस का विषय: अंतर्राष्ट्रीय व्यवसाय

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थीसिस का शीर्षक: वैश्विक वर्चुअल टीमों (जीवीटीएस) के प्रदर्शन में परिवर्तनशीलता को मापना

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यह थीसिस व्यक्तिगत कारकों और वैश्विक वर्चुअल टीमों (जीवीटीएस) के प्रदर्शन के बीच के जटिल संबंध का गहन अध्ययन करती है, जिसका उद्देश्य आज के वर्चुअल कार्य वातावरण में उनके प्रदर्शन को प्रभावित करने वाले कारकों का पता लगाना है। विस्तृत विश्लेषण के माध्यम से, यह वैश्विक वर्चुअल टीमों (जीवीटीएस) के प्रदर्शन में परिवर्तनशीलता के प्रमुख निर्धारकों की पहचान करती है, जिसमें टीम की सीखने की गतिविधियाँ, भावनात्मक बुद्धिमत्ता, विश्वास, टीम की रचनात्मकता और सहयोगी संस्कृति शामिल हैं। इन चरों और वैश्विक वर्चुअल टीमों (जीवीटीएस) के प्रदर्शन के बीच सकारात्मक संबंध टीम की गतिशीलता के महत्व को उजागर करता है, जिससे अनुभवजन्य-सम्मत प्रथाओं, निर्णय लेने, और रणनीतिक कार्रवाइयों की आवश्यकता पर जोर दिया जाता है।

वैश्विक वर्चुअल टीमों (जीवीटीएस) के प्रदर्शन को बढ़ाने के लिए मुख्य दृष्टिकोणों में सतत सीखने की संस्कृति को विकसित करना, भावनात्मक गतिशीलता को समझना, विश्वास बनाना, रचनात्मकता को प्रोत्साहित करना, और सहयोग को बढ़ावा देना शामिल है। इन रणनीतियों के बावजूद, सांस्कृतिक भिन्नताओं और तकनीकी सीमाओं जैसी चुनौतियों के लिए सक्रिय उपाय और बुनियादी ढांचे में निवेश की आवश्यकता होती है। अनुभवजन्य-आधारित प्रथाओं और पेशेवर विकास पर ध्यान केंद्रित करके, संगठन वैश्विक वर्चुअल टीमों (जीवीटीएस) को एक वैश्विक रूप से जुड़े बाजार में उत्कृष्टता प्राप्त करने, नवाचार को बढ़ावा देने और प्रतिस्पर्धात्मक बढ़त बनाए रखने में सक्षम बना सकते हैं। यह संश्लेषण वैश्विक वर्चुअल टीमों (जीवीटीएस) की गतिशीलता के प्रबंधन के लिए मार्गदर्शन प्रदान करता है, जो वर्चुअल सहयोग सेटिंग्स में टीम के प्रदर्शन को बढ़ावा देने और संगठनात्मक उद्देश्यों को प्राप्त करने के लिए रणनीतिक निर्णयों को सूचित करता है।

मुख्य शब्द: वैश्विक वर्चुअल टीमों (जीवीटीएस), वैश्विक वर्चुअल टीमों (जीवीटीएस) का प्रदर्शन, वैश्विक वर्चुअल टीमों (जीवीटीएस) के प्रदर्शन में परिवर्तनशीलता, टीम सीखने की गतिविधियाँ, भावनात्मक बुद्धिमत्ता, विश्वास, टीम की रचनात्मकता, सहयोगी संस्कृति।

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1 Introduction

The research, titled “Quantifying Global Virtual Teams’ (GVTs) Performance Variability”, unfolds across various sections. This section offers a systematic overview of the background and context surrounding virtual teams, followed by an explanation of the research problem and objectives guiding this study.

The Background section provides a thorough examination of the progression and significance of virtual teams in present work environments. The chronological context of virtual teams is explored, tracing their trajectory from their emerging stages as novel concepts in various organizations to their current status as central elements of global business strategies. Moreover, this section takes a look at the technological advancements and shifting paradigms that have contributed to the proliferation of virtual teams, highlighting their role in fostering collaboration and flexibility in the modern workplace.

The Research Problem and Objectives section describes the significant issues and aims of the research journey. It identifies the challenges inherent in assessing and quantifying the performance of global virtual teams’ (GVTs), shedding light on the intricacies of managing them. Furthermore, this section outlines the research objectives, which systematically cover discovering the drivers of global virtual teams’ (GVTs) performance and quantifying their performance variability using Simple Linear Regression (SLR) analysis. Through firsthand investigation and theoretical synthesis, the study aims to offer actionable insights for enhancing global virtual teams’ (GVTs) performance and driving organizational success in an increasingly interconnected world.

1.1 Background and Overview

The timeless acknowledgment encapsulated in the maxim - We’re becoming more virtual all the time!

Watkins (2013) asserted that “virtual teams have become a fact of business life”. Following the pandemic, companies swiftly adopted remote work technologies, resulting in a major transformation in work practices. Consequently, employees are now appreciating the advantages of having more flexibility in their work locations and schedules. (Gratton 2021)

In the early 1990s, the term “virtual team” was purely a novelty catchphrase in work organization. However, over the past decade, the thought has evolved to the extent that today, companies actively accept its underlying principles to strengthen agility and enhance global competitiveness. (Bergiel et al. 2008, 100) Originally, virtual teams emerged as a mechanism to foster innovation among leading global experts who faced constraints in travel due to time limitations. Presently, the acceptance of geographically dispersed teams predominantly stems from the demands inherent in recent business operations. (Ferrazzi 2014)

Olson and Olson (2000, 139) observed that the significant advancements in information technology at the turn of the century may have engendered ambitious objectives. The introduction of groupware has cultivated an expectation for seamless communication and effective collaboration, prompting major corporations to initiate global teams with the anticipation that technology can facilitate “virtual collocation” (Olson & Olson 2000, 139). Jimenez et al. (2017, 341) delineated that the imperative for global expansion, heightened mobility, and technological advancements has sparked the necessity and feasibility of expanding teams beyond traditional collocated structures, resulting in the birth of Global Virtual Teams’ (GVTs) as a pervasive phenomenon.

In the pursuit of an exploration of global virtual teams’ (GVTs), Maznevski and Chudoba (2000, 473) defined global virtual teams’ (GVTs) as

“groups that (a) are identified by their organization(s) and members as a team; (b) are responsible for making and/or implementing decisions important to the organization’s global strategy; (c) use technology-supported communication substantially more than face-to-face communication; and (d) work and live in different countries”.

Virtual teams are designed to align with organizational objectives, adapting their composition and membership to suit diverse strategic goals. Therefore, organizations should prioritize virtual team development initiatives that directly support strategic objectives. (Prasad & Akhilesh 2002, 104) In the early 2000s, the multinational enterprise VeriFone relied on virtual teams for its daily operations, while Microsoft utilized virtual teams to provide substantial support for global corporate customer sales and post-sales services. By 2001, estimates indicated that approximately 8.4 million employees in the USA alone were members of one or more virtual teams or groups. (Bergiel et al. 2008, 101)

The increasing prevalence of global virtual teams' (GVTs) is driven by technological advancements, the pursuit of diverse talent, cost-effectiveness, creativity, and originality, equal opportunities, productivity-driven performance, reduced discrimination, and the imperative for organizations to remain agile in a globalized business environment (Alkoud & Qatamin 2023, 1; Bergiel et al. 2008, 105-106).

The presence of diversity within virtual teams, particularly those with a global scope, can present both advantageous opportunities and potential challenges. A recent survey encompassing employees across 90 countries revealed that 89 percent of white-collar workers engage in projects within global virtual teams' (GVTs) on at least an occasional basis, necessitating a reliance on online communication tools. (Taras et al. 2021) This trend is unsurprising in globalized and particularly socially distanced world, where virtual collaboration plays an indispensable role in fostering connections among individuals (Taras et al. 2021).

The technological advancements and widespread adoption of virtual collaboration tools, a.k.a. digital communication tools, such as online communication and collaboration platforms, underscore the integral role that global virtual teams' (GVTs) play in contemporary work dynamics (Taras et al. 2021). Enabled by technological advancements, global virtual teams' (GVTs) present a myriad of advantages, encompassing the acquisition of an international perspective on business challenges and solutions, realization of economies of scale, utilization of complementary work cycles facilitating 24/7 productivity, tapping into the best talent regardless of geographical location, expeditious innovation and product launches, and the augmentation of local knowledge and presence (Derven 2016, 1).

In the realm of global virtual teams' (GVTs), the performance aspect takes center stage. Effective performance management is a crucial responsibility for leaders of global virtual teams' (GVTs) (Topaloglu & Anac 2021, 107). Many organizations implement a performance measurement system to evaluate both team and individual outcomes. Certain entities prioritize assessing team performance, emphasizing the belief that excessive focus on individual performance may compromise team cohesiveness. (Gheni et al. 2016, 91). Acquiring an understanding of the determinants of global virtual teams' (GVTs) performance proves invaluable in fostering high-quality decision-making, proficient

problem-solving, and enhancing various managerial processes (Topaloglu & Anac 2021, 107).

In essence, global virtual teams' (GVTs) have become increasingly prevalent, navigating their multifaceted intricacies poses significant challenges, particularly in quantifying their performance. This ongoing journey of investigating the intricacies and dynamics of Global Virtual Teams' (GVTs) holds the promise of shedding light on the evolving landscape of virtual collaboration and on the performance aspects of global virtual teams. These investigations have the potential to illustrate the evolving surroundings of virtual team performance, with far-reaching implications for the future of work. As the thesis moves forward, the ins and outs of the global virtual teams' (GVTs) performance becomes progressively visible and evident.

This exploration seamlessly transitions into the forthcoming section, scrutinizing the existing body of qualitative and quantitative research to understand the various degrees of global virtual teams' (GVTs) performance measurement to date. Prior research endeavors not only offer valuable insights but also help uncover the research problem and illuminate a research opportunity - an opportunity to advance the understanding of and reflect on global virtual teams' (GVTs) performance by exploring and identifying new determinants.

1.2 Research Problem and Objectives

The concept of global virtual teams' (GVTs) performance is not unidimensional (Zhu & Lee 2017, 35). Jones (2020, 175) highlights the growing concern among leaders of global virtual teams' (GVTs) regarding team performance, as the increasing prevalence of global virtual teams' (GVTs) prompts an expectation for them to achieve comparable, if not superior, levels of performance compared to traditional teams.

Management experts concur with the assertion that teams constitute the fundamental unit of performance within any organizational structure (Bergiel et al. 2008, 99). Team performance has consistently remained a pivotal aspect for organizations, commonly perceived as the ultimate objective. Hackman (1987) defined the team performance as "the level a team meets or exceeds the performance standards of those who review the output". (Zhu & Lee 2017, 32)

Scholars have assessed the performance of global virtual teams' (GVTs) either through qualitative methodologies or projected it using various explanatory variables via quantitative approaches. Bergiel et al. (2008, 101) utilized literature reviews and expert interviews, asserting that the achievement of successful and fulfilling team experiences, whether in a virtual or traditional setting, is defined by shared characteristics or traits, with the core of team performance fundamentally hinging on discipline and incorporating elements of leadership, peer interactions, and individual self-imposed standards.

Sahin et al. (2024, 7-8) utilized a configurational qualitative approach [fuzzy-set qualitative comparative analysis (fsQCA)], revealing a nuanced relationship between cultural values and global virtual teams' (GVTs) performance, where high gender egalitarianism, low power distance, and their nuanced interaction effects with collectivism emerged as significant explanatory variables, offering valuable insights to comprehend and improve the performance of global virtual teams' (GVTs).

Utilizing global virtual teams' (GVTs) self-assessment survey data, Gluesing and Riopelle (2010, 6552) examined five key dimensions impacting overall team performance: the team's mission and objectives clarity and commitment, characteristics of individual team members, characteristics of teaming processes, the use of communication/information technology, and characteristics of the team's context(s). The Linear Regression Model, significant at a 5.0% p-value with an Adjusted R-Square of 0.80, identified that only the "mission and objectives" was a significant explanatory variable of team performance, explaining 80.00% of the variability, while the other four dimensions did not contribute significant predictive value to the model (Gluesing & Riopelle 2010, 6553).

Phadnis et al. (2013, 7) utilized Multiple Regression Analysis on data from four surveys to predict the performance of global virtual teams' (GVTs), incorporating various constructs such as Teamwork Characteristics, Team Engagement, Communication Methods, Team Decision-Making Approach, and Demographic Variables. The findings revealed that "Intra-team Trust" emerged as the sole statistically significant explanatory variable of global virtual teams' (GVTs) performance, explaining 8.0% to 9.0% of the variance in team performance (Phadnis et al. 2013, 10).

This underscores the pivotal role of trust in cultivating a "high common ground" within virtual teams, as emphasized by Olson and Olson (2000, 168). Notably, individual

attributes, specifically “GMAT Analytical Score” and “Class Rank”, were identified as significant explanatory variables, with lower class rank positively influencing team performance. Furthermore, the study indicates that individual analytical reasoning capability, class performance, and intra-team trust collectively account for 21.0% to 23.0% of the variation in global virtual team performance. (Phadnis et al. 2013, 8)

In Bullard’s (2019, 4) investigation, an exploration of the impact of communication technology, mode of interaction, and diversity on shared understanding was conducted, specifically emphasizing the prediction of the performance of global virtual teams’ (GVTs) using Shared Understanding as an independent variable. Multiple regression analysis revealed a statistically significant positive association between Shared Understanding and team performance (Beta = 0.618, p-value < 0.001), with Shared Understanding accounting for 38% of the variance in team performance (Adjusted R² = 0.377) (Bullard 2019, 76).

Malhotra and Majchrzak (2009, 9-11) researched the global virtual teams’ (GVTs) performance using Partial Least Squares (PLS) analysis and Ordinary Least Squares (OLS) regression. The study directed towards the influence of interaction effects between the context of virtual teams and technology support on team performance. The identified interaction terms significantly explained 36% variance in the performance of global virtual teams’. These results were reaffirmed through OLS regression, where the two interaction terms were found to be significant, supporting the study’s main assertions. (Malhotra & Majchrzak 2009, 9-11)

A universally accepted definition of global virtual teams’ (GVTs) performance remains vague, despite ongoing research efforts. Existing definitions and indicators of global virtual teams’ (GVTs) performance, derived from the qualitative and quantitative research findings explained above, are detailed in the table below.

Table 1. Definitions of Global Virtual Teams’ Performance

Katzenbach and Smith (2001) suggest that “team performance, be it virtual or not, is primarily about discipline - leader, peer, and self-imposed” (Bergiel et al. 2008, 101).

Sahin et al. (2024, 5) propose utilizing the Overall Quality of Report evaluation scores as an indicator of team performance, whereby the effectiveness of teams in developing

innovative and well-supported solutions to real-life business challenges is gauged through a comprehensive assessment of aspects such as economic feasibility, novelty/creativity, originality, supporting arguments, and presentation.

Team performance is indicated by the comprehensive assessment of five dimensions outlined in the Global Virtual Teams' Self-Assessment Survey: mission and objectives commitment, team member characteristics, team processes, information technology usage, and shared team context, serving to evaluate the effectiveness of global teaming processes and technologies. (Gluesing & Riopelle 2010, 6552).

Phadnis et al. (2013, 2) explained that team performance, as measured through the team's ROI, is fundamentally shaped by a combination of individual abilities such as analytical reasoning and overall intellectual competence, alongside the pivotal factor of trust among team members.

Team performance measures, drawn from Potter and Balthazard (2002), originally derived from Cooke and Lafferty (1988), encompass four primary facets: Solution Acceptance, Satisfaction, Group Commitment, and Perceived Efficiency. (Bullard's 2019, 45)

Malhotra and Majchrzak (2009, 2-6) explained team performance within virtual teams is influenced by the alignment of technology usage with contextual requirements, encompassing virtual workspace technology (VWT) usage by team members and contextual information provided by team leaders.

In crux, the landscape of global virtual teams' (GVTs) performance is multifaceted, shaped by various factors that have been explored through both qualitative methodologies and quantitative approaches. Scholars have delved into this intricate realm using diverse methodologies, including configurational qualitative approaches, self-assessment surveys, and regression analyses. While qualitative methodologies like fuzzy-set qualitative comparative analysis have unveiled nuanced relationships between cultural values and global virtual teams' (GVTs) performance, quantitative approaches have utilized simple linear regression models and multiple regression analyses to identify key

explanatory variables. Notably, studies employing simple linear regression models, such as Gluesing and Riopelle (2010) and Phadnis et al. (2013), revealed the importance of specific dimensions like mission and objectives and intra-team trust, respectively, in explaining global virtual teams' (GVTs) performance. Surprisingly, none of these studies concretely defined the global virtual teams' (GVTs) performance.

This thesis, titled "Quantifying Global Virtual Teams' (GVTs) Performance Variability", represents a compelling research opportunity to delve into the complex dynamics shaping the performance of global virtual teams' (GVTs). The chief focus of the thesis revolves around the notion of global virtual teams' (GVTs) performance, which I refer to as the effectiveness and efficiency of virtual teams working across geographical boundaries on a series of projects in a virtual setting, achieving their objectives, and delivering results irrespective of challenges such as cultural diversity, time zone disparities, and geographical separation. It is crucial for organizations to understand, reflect on, and quantify the performance of global virtual teams' (GVTs) in order to capture the full potential of virtual teams.

Quantifying the performance of global virtual teams' (GVTs) stretches beyond pure individual contributions to the shared team achievements, centered around hypothesizing numerous significant factors, namely team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture, all of which are closely associated to global virtual teams' (GVTs) performance. According to Edmondson (1999, 353), team learning behaviors facilitate overall team performance and encompass both internal learning, which involves asking questions, experimenting, reflecting on results, and discussing errors, as well as external learning, which entails seeking information and feedback from outside the team. Jordan and Lawrence (2009, 452) argued that emotional intelligence, a multidimensional construct integrating emotion and cognition to enhance human interactions, has been associated with enhanced workplace behavior, notably within teams, leading to improved team performance.

As per Frei and Morriss (2020), "Trust is the basis for almost everything we do". Trust serves as the primary foundation among team members, acting as the expectation or belief upon which team performance depends (Ahmed 2014, 4993). Creativity in team processes involves exploring diverse alternatives and criteria, generating novel and valuable ideas that expand beyond the initial considerations, thus fostering innovation

and enhancing performance (Stahl et al. 2010, 3). According to Hurley and Hult (1998), collaboration culture is “the degree to which people in the group actively support and help one another in their work” (Nauman et al. 2022, 25). Taras et al. (2013, 425) asserted that participants in Group Virtual Trainings (GVTs) engaged in collaborative learning and coordinated efforts with team members, resulting in enhanced knowledge, behavioral modifications, and improved performance outcomes. In essence, understanding, reflecting on, and hypothesizing variables - team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture individually is crucial for measuring the proportion of variability in the performance of global virtual teams’ (GVTs).

Although previous research has explored various facets of global virtual teams’ (GVTs) dynamics, there remains a need for a comprehensive investigation that quantifies the proportion of variability in global virtual teams’ (GVTs) performance explained by individual variables. This study employs a quantitative research approach, specifically utilizing Simple Linear Regression (SLR), to examine how independent variables such as team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture individually contribute to explaining the variability in global virtual teams’ (GVTs) performance.

In essence, while prior research has addressed different aspects of global virtual teams’ (GVTs) dynamics, a gap persists, requiring a thorough investigation to quantify the variability in their performance by considering individual variables such as team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture. This study aims to fill this gap by conducting a data-driven exploration of these variables and statistically analyzing how they explain the variability in global virtual teams’ (GVTs) performance.

Research Problem: *The core research problem is to understand the dynamics of the effectiveness and efficiency of global virtual teams, whereby the focus is on the performance of global virtual teams as an outcome of their interactions. Specifically, it seeks to explore how various individual variables, including team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture, influence the performance of global virtual teams.*

Research Objectives: *The research objectives are twofold:*

1. To examine the interplay between individual variables - team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture - and the performance of global virtual teams.

2. To quantify the proportion of variability in global virtual teams' performance explained by these individual variables using Simple Linear Regression analysis.

Filling the gaps in relation to global virtual teams' (GVTs) performance variability enhances theoretical knowledge as well as offers useful insights for managers and leaders striving to boost the performance of their global virtual teams' (GVTs). The aim of the research is to provide a systematic understanding of global virtual teams' (GVTs) performance by utilizing a quantitative research approach and leveraging Simple Linear Regression (SLR). The outcomes of this study have the capacity to navigate informed decision-making, strategic-tactical alignment, and innovation and cultural excellence within global virtual teams' (GVTs), thereby enhancing and advancing organizational success in a progressively unified world.

Understanding and reflecting on the quantitative details of global virtual teams' (GVTs) performance is academically interesting as well as holds realistic implications for professional teams in organizations operating in a globalized landscape. The ability to quantify and boost global virtual teams' (GVTs) can translate into definite outcomes, including improved project deliverables, enhanced analysis and creativity, better customer satisfaction, and increased strategic-tactical competitiveness. Readers gain reasonable insights into quantifying the performance of global virtual teams' (GVTs) by engaging with this research.

Academically, this research aims to explore the intricacies of global virtual teams' (GVTs) performance, focusing on the nuanced interactions between individual variables and team outcomes. It seeks to provide theoretical frameworks within organizational behavior and management studies, offering empirical evidence to enhance existing literature. By elucidating how these factors interplay to shape global virtual teams' (GVTs) effectiveness, this contribution advances theoretical understanding and establishes a foundation for future research in virtual team performance. Scholars stand to gain a deeper understanding of the factors influencing global virtual teams' (GVTs) performance, facilitating refinement of existing theories and the development of more accurate simple regression models.

In the present view of globalized businesses, the effective functioning of global virtual teams' (GVTs) is paramount for organizational success. This research identifies and quantifies the drivers of global virtual teams' (GVTs) performance, providing useful insights for managers and leaders to enhance team performance. These insights inform decision-making regarding team composition, training initiatives, and fostering a conducive work culture for virtual collaboration, ultimately improving project outcomes and organizational success. Leveraging Simple Linear Regression to develop regression models, managers gain a practical tool for assessing and optimizing global virtual teams' (GVTs) performance in real-time. Equipped with the tools and knowledge from this research, leaders and managers can harness the full potential of their global virtual teams' (GVTs), ensuring competitiveness in today's interconnected business landscape.

As institutions and organizations continue to embrace virtual collaboration as a cornerstone for running their businesses, the findings of this research hold meaningful inference for academia and industry. By uncovering the drivers of global virtual teams' (GVTs) performance and developing quantitative models using various variables leveraging Simple Linear Regression, this study contributes to the ongoing discussion regarding global virtual teams' (GVTs) performance. Ultimately, the aim of the research is to promote a new approach to measuring the proportion of variability in global virtual teams' (GVTs) performance explained by team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture.

The subsequent section of this research, the Literature Review, is organized into distinct features. Section 2.1 provides an overview of global virtual teams' (GVTs), setting the stage for a broad understanding of their work. Section 2.2 explores the factors influencing global virtual teams' (GVTs) performance, laying the foundation for the subsequent exploration. Through these features, the Literature Review offers a robust foundation for the subsequent analytical exploration of simple regression models and their application in global virtual teams' (GVTs) contexts.

2 Literature Review

The literature review for the thesis on “Quantifying Global Virtual Teams’ (GVTs) Performance Variability” centers around core features related to the research topic. In the first section, a synopsis of global virtual teams’ (GVTs) is provided, covering their definition(s), characteristics, and benefits. The existing literature on challenges faced by global virtual teams’ (GVTs) is examined, setting the base for understanding the complications inherent in such team structures.

Turning to factors influencing the performance of global virtual teams’ (GVTs), the literature delves into the exploration of team learning behaviors, followed by the impact of emotional intelligence on team performance, highlighting the crucial role emotions play in the virtual team environment. Additionally, the review explores the significance of trust, both affective and cognitive, in shaping the dynamics of global virtual teams’ (GVTs). The influence of team creativity and a collaborative culture on overall team performance is also examined, shedding light on the multifaceted factors contributing to success in this context.

By examining and synthesizing the existing body of knowledge, this literature review sets the stage for the subsequent quantitative research, specifically employing a survey and Simple Linear Regression (SLR) to test research hypotheses involving an array of independent variables, including team learning behaviors, emotional awareness and management, trust, team creativity, and collaborative culture.

2.1 Global Virtual Teams

2.1.1 Concept and Definitions of Global Virtual Teams

In light of the growing global nature of business, teams are increasingly adopting a framework that is both global and virtual. The advancement of technology in communication is enhancing virtual collaboration, leading to a growing trend of organizations relying more on electronic communication. Consequently, teams are increasingly becoming virtual, characterized by geographically dispersed and culturally diverse members, commonly referred to as global. (Gibson et al. 2014, 218)

Hinds et al. (2011, 138) noted that industry research from 2000 (Gartner Group Survey) projected that by 2004, 60% of professional and managerial work at Global 2000

companies would be conducted through virtual teams. Global companies rely on the seamless coordination of vital resources and information dispersed across various geographical locations for their competitive edge. A highly effective mechanism for achieving this integration is through Global Virtual Teams' (GVTs), composed of individuals from diverse nationalities, cultures, businesses, and functions collaborating to coordinate multinational operations on a global scale. (Govindarajan & Gupta 2001)

Global virtual teams' (GVTs) have emerged as the "new normal" for businesses expanding across borders and tapping into broader talent pools amid skill shortages (Derven 2016, 1). Global virtual teams' (GVTs) consist of individuals collaborating across various geographic locations, potentially speaking different languages, and representing diverse cultural backgrounds, utilizing information and communication technology for communication and coordination activities (Gheni et al. 2016, 74).

The evolving landscape of global virtual teams' (GVTs) has resulted in a multitude of definitions and nomenclature, with terms like multinational and multicultural distributed teams, transnational teams, and others being interchangeably utilized to characterize the phenomenon of global virtual teams' (GVTs) (Wildman & Griffith 2014, 14). A universally acknowledged definition of global virtual teams' (GVTs) continues to be elusive (Curseu et al. 2008, 629). The following are some existing definitions derived from current research.

Table 2. Existing Definitions of Global Virtual Team(s)

<p>Lipnack and Stamps (1997) define a virtual team as "a group of people who interact through interdependent tasks guided by common purpose" and work "across space, time, and organizational boundaries with links strengthened by webs of communication technologies" (Maznevski & Chudoba 2000, 473-474).</p>
<p>Jarvenpaa and Leidner (1999, 792) defined a global virtual teams' (GVTs) to be a temporary, culturally diverse, geographically dispersed, electronically communicating work groups.</p>
<p>Wong and Burton (2000, 341-342) defined three key dimensions of a virtual team: context, composition, and structure. These encompass contextual factors such as minimal team history, novel tasks, and geographically dispersed members; diversity in</p>

cultural and organizational backgrounds in team composition; and the presence of lateral but weak relationships due to the absence of prior connections, along with the presence of cultural and organizational barriers in the virtual team structure.

Maznevski and Chudoba (2000, 473) defined global virtual teams' (GVTs) as groups that (a) are identified by their organization(s) and members as a team; (b) are responsible for making and/or implementing decisions important to the organization's global strategy; (c) use technology-supported communication substantially more than face-to-face communication; and (d) work and live in different countries.

Zigurs (2003, 340) defined virtual team as a pool of people who are geographically and/or organizationally or otherwise distributed and who work together via communication and information technologies in order to realize their specific goal.

Martins et al. (2004, 807) defined the global virtual teams' (GVTs) as a collection of physically distributed people who work together on a project and use communication and information technologies to communicate and coordinate their efforts to achieve a shared organizational task.

Virtual teams consist of (a) two or more persons who (b) work together engagingly to achieve common goals, while (c) at least one of the team members works at a different site, company, or in a different time zone, so that (d) communication and coordination are chiefly based on electronic communication media (e.g., email, fax, phone, video conference). (Hertel et al. 2005, 71)

At heart, rooted in the above definitions of global virtual teams' (GVTs), these teams embody traits such as interdependence, a common objective, and reliance on communication technology. They function as temporary, culturally diverse, and geographically dispersed work groups utilizing electronic communication. Key dimensions encompass contextual factors, diverse team composition, and the virtual team structure. Emphasis is placed on organizational identification, decision-making responsibility, and international collaboration, along with geographically and organizationally dispersed cooperation facilitated by information technologies. In crux,

global businesses today rely on global virtual teams’ (GVTs) to channelize diversity and local proficiency, strategically positioning themselves for a competitive edge, largely through collaboratively working individuals who predominantly rely on electronic communication, often with at least one member situated in a different location.

2.1.2 Types of Global Virtual Teams

Virtual teams are categorized into distinct forms determined by factors such as team size and interconnectivity, with classification based on the number of locations and managers forming four primary types (Youssef et al. 2023, 2).

Virtual Team Matrix		Managers	
		One	Multiple
Locations	One	Teleworkers	Matrixed Teleworkers
	Multiple	Remote Teams	Mixed Remote Teams

Figure 1. Virtual Team Matrix

(Modified from Youssef et al. (2023, 2))

The selection of a specific virtual team configuration depends on the unique requirements of a business, its operational milieu, and the capabilities of its workforce, with seven fundamental types of virtual teams available for implementation (Duarte & Snyder 2011, 4-8).

Table 3. Types of Virtual Teams

<p>Networked Teams: A networked virtual team is composed of individuals collaboratively working towards a shared goal or objective. The team’s composition is</p>

often diffuse and dynamic, with members rotating in and out based on their expertise requirements. In many cases, team members may not have complete awareness of all individuals, work teams, or organizations within the network.

Parallel Teams: These are temporary teams established to fulfill specific tasks or functions that the regular organization is not equipped to handle. Distinguished by a distinct membership, these teams are identifiable within the broader organizational structure.

Project or Product Development Teams: Members of these teams undertake projects for users or customers over an extended period, resulting in the creation of a new product, information system, or organizational process. Unlike parallel teams, project teams typically have a longer lifespan and possess the authority to make decisions rather than mere recommendations.

Work, Functional, or Production Teams: Virtual work, functional, and production teams engage in regular and ongoing tasks within a specific function, characterized by well-defined membership and roles.

Service Teams: These teams are tasked with providing global support for an organization's products, utilizing a 24/7 clock to ensure continuous customer assistance. The team members are strategically positioned worldwide, allowing for seamless operational coverage at all times, following the concept of "follow the sun".

Management Teams: Comprising managers or executives located across regions or countries, these teams collaborate daily to oversee organizational functions and strategic initiatives.

Action Teams: Immediate response teams that collaborate virtually, often in response to emergencies, ensuring swift and effective coordination.

(From Duarte & Snyder 2011, 4-8)

2.1.3 Reasons of Popularity

Global virtual teams' (GVTs) are witnessing a surge in popularity (Saunders et al. 2004, 1), evolving from being occasional occurrences to establishing themselves as the prevailing standard (Phadnis & Caplice 2013, 1). Global virtual teams' (GVTs) have rapidly gained traction among multinational corporations, with indications pointing towards a continuous surge in adoption. This trend marks a significant departure from the skepticism expressed in 1992 by Nohria and Eccles regarding the feasibility of network organizations solely reliant on electronic networks, as global virtual teams' (GVTs) now represent a prevalent organizational structure across various industries. (Wildman & Griffith 2014, 14)

Global virtual teams' (GVTs) have gained popularity due to various factors. Firstly, organizations increasingly depend on virtual teams to achieve goals, especially as problem-solving knowledge surpasses individual capacities. (Saunders et al. 2004, 1) Secondly, the growth in telecommunication bandwidth encourages the use of networks connecting individuals within and outside the organization. Lastly, developments in collaborative technologies, such as groupware, enhance the effectiveness of virtual teams in collaboration and decision-making practices. (Saunders et al. 2004, 1)

In the present global economy, companies increasingly count on global virtual teams' (GVTs) and decisively form physically dispersed teams that bring together top functional expertise from around the globe. These teams combine global proficiency with deep, local knowledge of the most promising markets to ensure success. (Neeley 2015) Based on data provided by Gallup and the Bureau of Labor Statistics, approximately 22% of Americans engage in remote work from home, with nearly half actively participating in remote or virtual team collaborations (Dhawan & Chamorro-Premuzic 2018).

In the realm of global virtual teams' (GVTs), current statistics reveal a notable landscape in 2023. Presently, 12.7% of full-time employees engage in virtual work from home, showcasing the rapid integration of global virtual teams' (GVTs) environments. (Haan 2023) Looking ahead, Upwork projects that by 2025, around 32.6 million Americans, constituting 22% of the workforce, will be involved in virtual work, indicating a steady shift towards global virtual teams' (GVTs) arrangements. This aligns with worker preferences, as 98% express a desire to engage in virtual work at least part

of the time, emphasizing the growing appreciation for the flexibility and improved work-life balance associated with global virtual teams' (GVTs). (Haan 2023)

The attractiveness of establishing global virtual teams' (GVTs) is evident for numerous reasons. Wildman and Griffith (2014, 15-16) highlight that the primary benefit of global virtual teams' (GVTs) lies in their capacity to assemble project teams comprising talented individuals worldwide, facilitated by technological interfaces. Moreover, the challenges posed by cultural diversity and geographical dispersion can transform into organizational advantages, fostering the creation of highly functional global virtual teams' (GVTs) composed of individuals from diverse cultural backgrounds, thus enhancing performance, especially in tackling complex tasks (Wildman & Griffith 2014, 15-16).

Global virtual teams' (GVTs) offer objective benefits in terms of cycle time, timeliness, and productivity by leveraging global distribution and asynchronous work, facilitating continuous operations across diverse time zones. Additionally, the distributed nature of global virtual teams' (GVTs) enhances quality through access to expertise across geographical locations, fostering a collaborative environment that aligns with their objectives, and contributes to heightened customer satisfaction by maintaining proximity to multiple clients. (Gibson & Cohen 2003, 148-149)

Furthermore, global virtual teams' (GVTs) instrumental in savings company's resources by minimizing the physical office spaces and related expenses requirements, thereby allowing companies to allocate resources consciously and invest in technology for seamless communication and collaboration. In heart, the adoption of global virtual teams' (GVTs) not only reorganizes operations but also positions companies to thrive in a dynamic and interconnected global business landscape. (Gibson & Cohen 2003, 148-149)

Conversely, global virtual teams' (GVTs) provide subjective benefits in respect of novelty and originality, exploiting the physical dispersion to incorporate the expertise of the best professionals worldwide, thereby simplifying access to knowledgeable insights. Furthermore, these teams contribute significantly to organizational learning and the dissemination of best practices, accommodating diverse functions and stakeholders, thereby fostering the widespread sharing of knowledge derived from the team's collective efforts. (Gibson & Cohen 2003, 149-151)

The interpersonal networks cultivated within this virtual setting not only enhance the capacity for learning from subsequent activities but also utilize electronic communication as a fundamental element in effective knowledge management. Additionally, global virtual teams' (GVTs) positively impact attitudes and team longevity by affording members the flexibility to avoid mandatory relocations, thereby elevating overall employee satisfaction and promoting a deep understanding of collaborative effectiveness across distances through electronically-mediated relationships - an invaluable asset for subsequent projects built on the foundation of these established connections. (Gibson & Cohen 2003, 149-151)

Thompson and Caputo (2009, 2-3) emphasized the substantial benefits of global virtual teams' (GVTs) for organizations, citing examples like Sun Microsystems' \$70 million savings with 18,000 virtual workers, IBM's 60% reduction in real estate costs, and Nortel's \$22 million annual savings through telework. On average, adopting virtual work can result in organizations saving \$5,000 to \$8,000 per employee in real estate costs alone. Additionally, global virtual teams' (GVTs) contribute to improved employee performance and retention, with productivity gains ranging from 10% to 43% and retention increases between 10% and 50%, as supported by a WorldatWork survey where 85% of HR professionals reported a moderate or high impact on employee retention. (Thompson & Caputo 2009, 2-3)

Furthermore, Thompson and Caputo (2009, 2-3) outlined the advantages of virtual work, particularly in recruitment and organizational attraction. Aon Consulting's 2008 Benefits and Talent Survey spotted virtual work as a nucleus in attracting and retaining talent, particularly appealing to Generation Y employees valuing work-life balance. This strategic advantage becomes gradually vital for companies facing the approaching leadership and talent gap, supported by the environmental and organizational sustainability benefits of global virtual teams' (GVTs), such as real estate savings and reduced energy consumption. (Thompson & Caputo 2009, 2-3)

2.1.4 Challenges to Navigate

Embracing the advantages of global virtual teams' (GVTs) undoubtedly enhances flexibility for employees, fostering global collaboration and enabling access to premier global talent while concurrently optimizing real estate expenditures. However, effectively

navigating the challenges of global virtual teams' (GVTs) presents a formidable hurdle. (Ferrazzi 2014)

According to Jimenez et al. (2017, 344), time-zone dispersion emerges as a significant challenge for global virtual teams' (GVTs), impacting logistical operations and work-life balance, while also hindering the transfer of tacit knowledge, particularly over online communication channels. Additionally, the geographical distribution of team members complicates coordination efforts, making it difficult to organize synchronous interactions across multiple time zones, despite intermittent advantages such as continuous productivity. (Jimenez et al. 2017, 344)

Wildman and Griffith (2014, 15) identified a myriad of challenges faced by global virtual Teams' (GVTs) due to the diverse boundaries they traverse, encompassing technological, geographical, temporal, and cultural realms. Among these challenges are role overload, ambiguity, counterproductive work behaviors, and negative teamwork dynamics such as social loafing, all of which can impede the functionality of virtual teams.

Furthermore, linguistic disparities frequently foster social categorization and biases within global virtual teams' (GVTs), potentially eroding team dynamics and exacerbating conflicts. Interestingly, while text-based communication can mitigate certain language-related hurdles by diminishing social categorization, it concurrently heightens the risk of misinterpretation, leading to a paradoxical scenario where virtual communication may alleviate interpersonal conflict but exacerbate task conflict. (Jimenez et al. 2017, 345)

Cultural disparities present further hurdles, as differences in cultural values, such as collectivism and individualism, shape individuals' interpretation of information and decision-making processes. Multicultural teams often struggle to achieve their full potential due to variations in communication styles, behaviors, and goals across cultures, leading to increased possibilities of misunderstandings and conflicts within the team dynamics. (Wildman & Griffith 2014, 15)

Moreover, the intricate nature of communication within global virtual teams' (GVTs) is compounded by the linguistic diversity among members. Proficiency in a shared language can foster interaction and knowledge sharing, but variations in language

skills among team members may lead to exclusion or undervaluation of contributions, especially given the constraints of electronic communication channels in conveying nonverbal cues essential for building relationships and establishing trust. (Jimenez et al. 2017, 344)

Gibson and Cohen (2003, 96-103) emphasized that global virtual teams' (GVTs) pose distinct challenges, involving self-management, virtual communication, cultural sensitivity, trust-building, and proficiency in information technology. Addressing challenges at the team level involves navigating the establishment of goals, agreement on norms, problem-solving, conflict resolution, balancing relationship, and task activities, fostering a learning orientation, and periodic team renewal. Simultaneously, effective leadership stands as a critical and challenging component essential for constructing a successful virtual team. (Gibson & Cohen 2003, 96-103)

Hinds et al. (2011, 155-159) outlined challenges faced by global virtual teams' (GVTs), including the struggle to establish a shared understanding of work due to the absence of common learning experiences and limited visibility of knowledge across distant sites, alongside the difficulty in perceiving aligned interests, and they also underscored the impediment posed by the variation in problem framing and suitable practices across different national cultures in evolving solutions to similar problems, given the variance in the assignment of meaning.

Gibson et al. (2014, 237) underscore the unique challenges faced by leaders of global virtual teams' (GVTs), where traditional team-building strategies encounter significant hurdles due to the geographical dispersion of team members. Despite the ubiquity of online tools, the absence of face-to-face (FTF) interactions complicates effective team building, necessitating a reliance on FTF interactions whenever feasible. Furthermore, the cultural diversity inherent in global virtual teams' (GVTs) mandates a nuanced understanding of each member's communication style, context, goals, and responsibilities to mitigate the limitations posed by leaner communication media, particularly for individuals from higher-context cultures who heavily rely on nonverbal cues for communication interpretation (Gibson et al. 2014, 233).

In a pivotal 2001 investigation comprising 70 groups, Professors Vijay Govindarajan and Anil Gupta uncovered that 82% fell short of their goals, with 33% rating themselves as largely unsuccessful. A 2005 Deloitte study on IT projects

outsourced to virtual work groups reported a 66% failure rate in meeting client requirements. (Ferrazzi 2014) Notably, research indicates a prevailing perception of diminished productivity in virtual communication compared to face-to-face interaction, with almost half acknowledging confusion and overwhelm stemming from collaboration technology (Ferrazzi 2014).

Undoubtedly, a myriad of challenges confronts global virtual teams' (GVTs), spanning time-zone dispersion (Jimenez et al. 2017), geographical distribution (Wildman & Griffith 2014), linguistic disparities (Jimenez et al. 2017), cultural differences (Wildman & Griffith 2014), and technological barriers (Gibson & Cohen 2003). However, amid this intricate landscape, the foremost challenge for leaders and managers remains accurately quantifying the performance of global virtual teams' (GVTs) variability.

Gibson and Cohen (2003, 110) stressed that global virtual teams' (GVTs) present unique challenges for assessing performance compared to face-to-face settings. Unlike traditional teams, global virtual teams' (GVTs) members and leaders may struggle to observe a substantial portion of their colleagues' contributions due to diverse organizational and national cultures (Gibson & Cohen 2003, 110).

The challenge bring to light by Chudoba et al. (2005, 2) revolves around the difficulty in measuring the performance of global virtual teams' (GVTs) due to the absence of a precise definition, which not only hinders the assessment of how virtual team dynamics influence overall team performance but also complicates the design and implementation of infrastructures and toolsets necessary for supporting distributed work environments.

Furthermore, according to Harvey et al. (2004, 289), the gauging performance of global virtual teams' (GVTs) presents a significant confrontation, with one of the primary difficulties lying in establishing a robust method to determine whether the team is effectively achieving its objectives and functioning efficiently.

In light of the several benefits and challenges associated with global virtual teams' (GVTs), the performance of these teams becomes an acute focus for companies seeking to harness the advantages of virtual collaboration. In the next section, the objective is to

understand the numerous variables influencing the performance of global virtual teams' (GVTs).

2.2 Variables Influencing Global Virtual Teams' Performance

2.2.1 Global Virtual Teams' Performance

Understanding and reflecting on the performance of global virtual teams' (GVTs) and their explanatory variables is both necessary and challenging. Exploring the dynamics that shape global virtual teams' (GVTs) performance demands a nuanced examination of influencing factors. Team performance within educational contexts often revolves around group project scores or grades, while in broader field studies, performance is frequently defined by the achievement of team objectives and desired outcomes. Alternatively, more objective indicators such as sales figures, workgroup bonuses, customer service quality, or sports team win rates are utilized to gauge team performance in various contexts. (Stahl et al. 2010, 9)

Ahmed (2014, 4993) offered a definition of team performance as the collective results achieved by individuals in meeting organizational requirements in terms of quality, quantity, and timeliness, while also encompassing the team's collaborative capacity to enhance future outcomes. Cohen and Bailey (1997), Henderson and Lee (1992), and Nidumolu and Subramani (2003) defined team performance as the effectiveness and efficiency with which a team achieves its project objectives (Zhang et al. 2011, 567).

Ebrahim et al. (2009, 2663) underscored the ambiguity surrounding virtual team performance, emphasizing the crucial influence of processes and interpersonal dynamics rather than technological factors in the midst of increasing adoption driven by business and social demands. Their findings stress the significance of tackling issues like conflict management, cultural diversity, and trust among team members, while advocating for additional research to uncover strategies for boosting performance and facilitating seamless transitions to distributed team models (Ebrahim et al. 2009, 2664).

Gibson and Cohen (2003, 111-112) underscore the multidimensional nature characterizing the performance of global virtual teams' (GVTs) and define virtual team performance as assessing both team outcomes, such as quality, quantity, creativity, cost,

and timeliness of deliverables, and individual contributions, including meeting personal deadlines and contributing to organizational knowledge, while also considering process dimensions unique to virtual teams, such as conflict resolution, information sharing, and collaboration effectiveness.

Building upon extensive interviews with virtual team leaders and members, alongside a comprehensive examination of existing literature on virtual teams, they assert that the principles governing performance measurement in traditional face-to-face teams hold equal relevance for their virtual counterparts. This highlights the significance of leveraging the robust performance evaluation frameworks established for conventional teams as a foundational basis for crafting tailored systems to assess the performance of global virtual teams' (GVTs). (Gibson & Cohen 2003, 110)

In the realm of virtual team research, the evaluation of performance measures has historically centered on benchmarking against traditional teams; however, given the structural distinctions between virtual teams and their traditional counterparts, it is imperative to shift the focus towards optimizing virtual teams performance rather than merely comparing it to traditional team standards (Powell et al. 2004, 19).

Numerous researchers, as highlighted by Powell et al. (2004, 13), have proposed that successful performance in virtual teams is achieved through comprehensive training, strategic goal setting, establishment of a shared language, active team-building efforts, fostering team cohesiveness, effective communication practices, synchronized coordination and commitment within the team, ensuring appropriate alignment between tasks and technology, and managing competitive and collaborative conflict behaviors.

In traditional face-to-face settings, performance assessment relies on observable behaviors, work outcomes, and team dynamics, often within shared organizational or cultural contexts. However, virtual teams lack these conditions, necessitating modifications in performance measures. (Gibson & Cohen 2003, 110)

Sparrow and Daniels (1999, 8) highlight the necessity for multidimensional performance measures in virtual teams, encompassing individual contributions, adaptability to evolving work arrangements, and knowledge acquiring-sharing abilities. This nuanced approach acknowledges the distinct dynamics and challenges inherent in virtual collaboration. Vinaja (2003, 343) noted that the performance of virtual teams is

often evaluated through the examination of various outcomes, including decision time, member satisfaction, participation levels, consensus building, and perceived decision quality.

Several researchers have arrived at the consensus that the pivotal variables for enhancing work-team performance encompass structure and design, which entail considerations such as equipment, materials, physical environment, and pay systems, thus advocating against prioritizing interpersonal factors in the pursuit of bolstering team performance (Edmondson 1999, 350). Quisenberry (2018, 20) highlights that virtual teams face distinct challenges absent in face-to-face settings, such as heightened risk exposure and unique task requirements for members and leaders. Despite their potential effectiveness, virtual teams often fail due to difficulties in trust-building, relationship nurturing, project coordination, and collaboration. Hence, organizational leaders must recognize key attributes and characteristics in team members and leaders before assembling teams for optimal performance. (Quisenberry 2018, 20)

Absolutely, extensive research has been conducted on the myriad variables affecting the performance of global virtual teams' (GVTs). Nonetheless, this thesis primarily focuses on examining individual determinants that influence global virtual teams' (GVTs) performance. Specifically, it involves a thorough investigation into interpersonal competencies, including team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture. The overarching goal is to highlight the individual impacts of each variable on the performance variability of global virtual teams' (GVTs).

In exploring the intricate dynamics of global virtual teams' (GVTs) performance, it is crucial to identify the underlying factors contributing to their variability. This research goes beyond merely listing variables; it aims to elucidate the interconnectedness and collective significance of team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture. These elements are fundamental to understanding global virtual teams' (GVTs) performance. By examining the interplay among these factors, this study provides a comprehensive narrative that clarifies their individual significance and their synergistic relationships within the broader context of global virtual teams' (GVTs) performance variability.

The choice of team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture as focal points stems from their pivotal roles in shaping global virtual teams' (GVTs) performance. Team learning behaviors reflect the team's ability to acquire new information, create new possibilities, and seek external resources or expertise, crucial for managing virtual collaboration complexities. Emotional intelligence supports awareness and management of own/others' emotions which leads to effective communication, conflict resolution, and team cohesion, fostering synergy within global virtual teams' (GVTs). Trust builds emotional bonds, empathy, and respect among team members and also offers knowledge and rational evaluation of team members' reliability and competence in virtual environments. Team creativity, driven by diverse skills, perspectives, knowledge, and collaborative environment, promotes diverse thinking, innovation, and problem-solving, enhancing global virtual teams' (GVTs) performance. Collaborative culture, with shared goals, norms, and values, creates an environment of shared goals, mutual support, and sense of ownership, essential for sustained global virtual teams' (GVTs) performance excellence.

These factors - team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture - are connected, forming an organized framework underpinning global virtual teams' (GVTs) operations. Team learning behaviors, through a culture of knowledge sharing, feedback-seeking, and continuous reflection, enhance emotional intelligence by fostering empathetic understanding and adaptive emotional responses. Trust naturally develops from consistent team interactions and shared experience which catalyzes a collaborative culture marked by open communication, transparency, and mutual respect. In turn, a collaborative culture boosts team creativity by providing a fertile ground for ideation, experimentation, innovation, and problem-solving. Thus, these factors operate synergistically, creating an integrated ecosystem where each component reinforces and amplifies the others, ultimately shaping global virtual teams' (GVTs) performance.

2.2.2 Team Learning Behaviors

Team learning behaviors play a crucial role in contemporary organizational dynamics. Before delving into team learning capabilities, it's essential to reopen the concept of "team psychological safety" a phrase coined by Amy Edmondson. Team psychological safety represents a shared understanding within a team where members feel inspired to

take risks, share thoughts, ask questions, and acknowledge mistakes, all without the fear of facing negative consequences. As described by Edmondson, it embodies “felt permission for candor”. (Gallo 2023)

Gallo (2023) highlighted that the significance of the ‘team’ aspect in team psychological safety lies in its group-level phenomenon, influencing the learning behavior of the group, which subsequently impacts team performance and contributes to organizational performance. Professor Edmondson’s research highlights that team psychological safety fosters a conducive environment for learning, enabling teams to efficiently identify and address challenges, consequently enhancing performance. Through a continuous learning cycle centered on evaluating successes, failures, and areas for improvement, teams cultivate higher performance levels progressively. (Cauwelier 2019, 69)

Conventionally, the concept of team learning has been characterized by its processes and resulting outcomes. Team learning is an ongoing endeavor involving reflection, information processing, and adaptation to environmental changes, aimed at enhancing project teams’ performance. (Ortega et al. 2010, 268) Team-level learning encompasses a shared vision among team members, mental models, and effective communication. It is characterized by the ability to respond adeptly to unexpected challenges rather than solely focusing on the enhancement of team performance. (Pinar et al. 2014, 71)

Team Learning Behavior, as defined by Edmondson (1999, 353), encapsulates the collaborative actions within a team aimed at iterative processes such as inquiry, feedback-seeking, experimentation, reflection, and open discussion of errors or unexpected outcomes, ultimately leading to improved performance and efficiency. This perspective underscores the necessity of breaking habitual behaviors to foster adaptation and improvement, aligning with Argote et al. (1999) notion of group learning, emphasizing knowledge acquisition, sharing, and integration through interaction activities (Edmondson 1999, 353).

Edmondson’s research (1999) primarily focused on team learning behaviors within collocated teams in a manufacturing firm, showcasing the positive impact of psychological safety on team performance. While Edmondson’s study provides valuable insights, the evolving nature of team structures necessitates an examination of team

learning behaviors in different contexts, such as global virtual teams' (GVTs). Therefore, it is crucial to acknowledge the distinction in settings and characteristics between Edmondson's study and the research on global virtual teams' (GVTs).

In contrast to Edmondson's (1999) study on collocated teams in a manufacturing context, research delves into the realm of global virtual teams' (GVTs) operating in multinational and virtual settings. These teams, as elucidated by Zettinig et al. (2022), consist of students from five international universities collaborating virtually on International Business (IB) strategy projects. Situated across different countries and operating within varied sociocultural and organizational settings, these teams engage in virtual collaboration to tackle a series of IB strategy projects. This distinction in team settings and characteristics is pivotal in understanding the nuances of team learning behaviors and their impact on performance within the context of global virtual teams' (GVTs).

Transitioning from Edmondson's (1999) research to the study, it is evident that the dynamics of team learning behaviors may vary significantly in the context of global virtual teams' (GVTs) due to factors such as geographic dispersion, cultural diversity, and reliance on digital communication technologies. Therefore, while building upon Edmondson's foundational work, the research aims to explore the interplay between team learning behaviors and performance within the unique context of global virtual teams' (GVTs).

There are two distinct forms of team learning: internal and external. Internal team learning involves members contributing their individual expertise, skills, and experiences to enhance the collective knowledge and capabilities of the team, while external team learning entails seeking external resources or expertise to address challenges encountered by the team in their work processes. (Pinar et al. 2014, 71) Edmondson (1996, 164) has defined internal learning as "the extent to which team members engage in behaviors to monitor performance against goals, obtain new information, test assumptions, and create new possibilities". Concurrently, External learning was designated by Edmondson (1996, 166) as "an assessment by several of the team's customers and/or managers about the extent to which team engages in behaviors such as seeking new information or asking those who receive or use its work for feedback".

Edmondson's research (1999, 353) indicates a positive correlation between team learning behaviors (internal and external), team learning outcomes, and team performance, with teams that demonstrate learning behaviors such as feedback attention, experimentation, and error discussion showing higher performance levels. Team learning outcomes are the results of collaborative interactions where individuals acquire, share, and integrate knowledge within a team context. These outcomes, which include adaptation to change, greater understanding, and improved performance, are facilitated by learning behaviors such as internal and external feedback-seeking and experimentation. (Edmondson 1999, 353)

Crucially, Edmondson (1999, 354) highlights the pivotal role of psychological safety in nurturing learning behaviors within teams and is characterized by an environment where members feel safe to take interpersonal risks. Psychological safety is vital for various reasons: Firstly, it advances team members' engagement and motivation by validating their inputs or contributions and enabling open communication without fear of backlash. Secondly, it strengthens decision-making by encouraging diverse views and opinions. Lastly, it nurtures a culture of constant learning and improvement by fostering an environment where mistakes are openly discussed and learned from. (Gallo 2023)

High levels of psychological safety within virtual teams facilitate open communication and trust, mitigating barriers like geographic dispersion and limited interaction, thereby promoting team learning behavior. Consequently, teams with enhanced psychological safety are expected to collaborate effectively, share knowledge, and utilize technology, leading to improved team performance in virtual environments. (Ortega et al. 2010, 269) In teams characterized by a robust sense of psychological safety, members exhibit confidence in addressing challenging topics and freely expressing their thoughts and emotions. Within such environments, learning unfolds seamlessly and persistently, fostering ongoing improvement in the team's performance. (Cauwelier 2019, 68)

Notably, psychological safety indirectly influences team performance, it serves as a catalyst for fostering learning behavior through trust and respect and enables teams to take appropriate actions to fulfill their tasks effectively. It is posited that psychological safety fosters learning behavior within teams, which, in turn, mediates the relationship between psychological safety and team performance outcomes, highlighting the intricate

interplay between team dynamics, learning behaviors, and improved performance outcomes. (Edmondson 1999, 355)

In a virtual setting, team learning behavior is paramount, as it directly correlates with enhanced team performance through the integration of dispersed members' understanding. Cultivating a culture of continuous learning within virtual teams not only boosts performance but also fosters long-term collaboration, ensuring sustained success in a dynamic environment. (Ortega et al. 2010, 269) Effective team learning behavior significantly contributes to the success and performance of virtual teams, facilitating the swift and effective resolution of complex and unforeseen challenges. This is particularly pronounced in virtual team environments characterized by asynchronous communication and dispersed team members, underscoring the criticality of ongoing learning initiatives. (Pinar et al. 2014, 68)

Edmondson's research analyzed team learning behaviors in 51 work teams at a manufacturing firm with approximately 5,000 employees. These teams were primarily functional, comprising managers, supervisors, and direct reports, such as sales, management, and manufacturing teams, each supporting a distinct functional department (Edmondson 1999, 358). Undoubtedly, Edmondson's research on team learning behaviors and team performance within a manufacturing firm's collocated teams yielded positive results, and aforementioned scholars are offering optimistic claims for virtual teams as well. In this study, the focus is on quantifying the performance variability of global virtual teams' (GVTs). Thus, the hypothesis is aligned with examining the claims of the aforementioned scholars in a global virtual setting, leading to the proposal of the following hypotheses.

***Hypothesis H1:** Team learning behavior is positively associated with global virtual teams' (GVTs) performance.*

Edmondson's insights (1999, 353) highlight a significant correlation between the open expression of thoughts and emotions within a team and the enhancement of team learning behaviors, ultimately leading to improved team performance. This exploration naturally sets the stage for a more comprehensive analysis of how emotional intelligence contributes to optimizing team performance in the subsequent section.

2.2.3 Emotional Intelligence

Emotional intelligence, defined as the capacity to understand one's own emotions, relate to others, and effectively express emotions, is utmost in the workplace. Within teams, the collective emotional intelligence of its members notably amplifies team performance, enriches unity and operational efficiency, eventually driving success in organizational endeavors. (Arora 2017, 43-44)

Emotional intelligence, enclosing emotional, affective, and social expertise within overall acumen, is increasingly known as vital for individuals in team-based companies, given the essential social nature of teamwork and the need to navigate diverse work environments and mutual interactions. The ability to understand and manage emotions functionally is becoming a necessary condition for successful team performance as companies increasingly rely on self-directed teams to achieve targets. (Frye et al. 2006, 49)

The idea of emotional intelligence gained widespread acceptance following the leading work of Goleman (1995). Goleman (1995, 53) explained emotional intelligence as encompassing “abilities such as being able to motivate oneself and persist in the face of frustrations; to control impulses and delay gratification; to regulate one's moods and keep distress from swamping the ability to think; to empathize and to hope”. However, the term "emotional intelligence" was primarily introduced by Salovey and Mayer in 1990. Emotional intelligence is generally defined as the “ability to monitor one's own and others' feelings and emotions, to discriminate among them, and to use this information to guide one's thinking and actions” (Salovey & Mayer 1990, 189).

Understanding the value of emotions and sentiments within teams is vital for managers seeking to raise their collective team performance. Emotional Intelligence (EI), as nucleus of emotional landscape, plays a sincere role in shaping individual and team performance and satisfaction. (Shafique & Naz 2023, 3) The collaborative drift of teamwork often stirs up varied emotional responses among team members, shaping their attitudes and behaviors within the group. Each individual's emotional intelligence, surrounding their emotions, moods, and feelings, contributes to the collective emotional intelligence of the team, thereby notably influencing overall team performance. (Jamshed & Majeed 2019, 6)

Emotional intelligence, characterized by its multi-dimensional nature bridging emotion and cognition, has shown significant associations with enhanced workplace behavior, notably within team dynamics, thus positively impacting team performance. (Jordan & Lawrence 2009, 2) Salovey and John Mayer outlined emotional intelligence into five core areas: self-awareness, essential for recognizing emotions as they arise; managing emotions, crucial for appropriate emotional expression; motivating oneself, involving the utilization of emotions to drive goal-directed behavior; empathy, rooted in emotional self-awareness and vital for understanding others' emotions; and handling relationships, which covers the skillful management of emotions in relational interactions. (Goleman 1995, 62-63)

Feyerherm and Rice (2002, 344) explained emotional intelligence as the capacity to adeptly monitor one's own emotions, discern among them, and leverage this insight to inform one's cognitive processes and behaviors. In simple terms, emotional intelligence is defined as the ability to understand and manage your emotions, as well as recognize and influence upon the emotions of those around you (Landry 2019).

Shafique and Naz (2023, 3) argue that teams enriched with high emotional intelligence levels exhibit heightened social aptitude, fostering cooperative dynamics essential for navigating complex projects through proficient communication and seamless information exchange. Jordan and Lawrence (2009, 4) offered that there is no doubt the mastery of emotional self-regulation and the skillful handling of others' emotions are pivotal elements influencing team performance, as they nurture positive interpersonal dynamics, optimize communication channels, and streamline the decision-making process, consequently bolstering effective conflict resolution mechanisms within teams.

Frye et al. (2006, 49) stated that effective functioning within teams relies, in part, on individuals' capacity to process emotional information and utilize it to foster productive interactions with their team members. Employees with elevated levels of emotional intelligence demonstrate a propensity for enhanced performance within team dynamics. They exhibit adeptness in effectively engaging with fellow team members, fostering collaborative environments conducive to innovation, and cultivating positive team-oriented atmospheres. (Quisenberry 2018, 23)

Conversely, individuals lacking in emotional intelligence can disrupt team synergy and impede performance, highlighting the pivotal role of emotional intelligence

in team dynamics and overall effectiveness. Ultimately, cultivating an environment where average emotional intelligence prevails can contribute positively to team performance, underlining the critical link between emotional intelligence and successful teamwork. (Shafique & Naz 2023, 3)

Rapisarda (2002) argued that the proficiency of emotional intelligence among team members is intricately linked to the extent of team performance (Quisenberry 2018, 25). However, Weiss and Cropanzano (1996) contend that emotional elements possess the potential to exert a lasting influence on team performance, albeit their manifestation may not be readily evident in the immediate term (Jordan et al. 2002, 200).

According to Quisenberry (2018, 23), awareness of own emotions, management of own emotions, awareness of others' emotions, and management of others' emotions are vital for team dealings and collaboration, creating foremost pieces of Team Emotional Intelligence. This implies emotional intelligence is typically broken down into four core abilities - Awareness of Own Emotions, Management of Own Emotions, Awareness of Others' Emotions, and Management of Others' Emotions. Figure 2 (modified) showing four competencies of emotional intelligence. (Landry 2019)

Emotional Intelligence	Own	Others
Awareness	Awareness of Own Emotions	Awareness of Others Emotions
Management	Management of Own Emotions	Management of Others Emotions

Figure 2. 4-Core Competencies of Emotional Intelligence

(Modified from Landry (2019))

Emotional self-awareness, incorporating the ability to recognize and articulate one's emotions in real-time, assists as a vital element of both individual and team dynamics. This ability, gauged through the skill of expressing emotions, demonstrates a strong association with amplified responsiveness to emotional signals and has been identified as a key variable in effective leadership and enhanced team performance by nurturing moderated emotional responses and enabling clearer communication within teams. (Jordan & Lawrence 2009, 5)

Birwatkar (2014, 118) asserted that awareness of own emotions is paramount for navigating the complexities of virtual team environments. In virtual setting, where managers face heightened demands and uncertainties, self-awareness enables them to make informed decisions amidst pressure, thereby bolstering team performance. By fostering clarity of thought and maintaining focus under pressure, self-awareness directly contributes to sound judgment and effective decision-making within virtual teams. (Birwatkar 2014, 118)

Jordan and Lawrence (2009, 5-6) highlight that the Management of Own Emotions involves the skill of regulating immediate reactions and expressing thoughts and feelings in a considered manner. This is exemplified by strategies such as delaying judgments and utilizing listening techniques. Such ability is crucial in team settings, where emotional self-regulation not only fosters healthier relationships but also significantly contributes to overall team performance, as demonstrated by studies linking emotional self-management to successful problem-solving exercises and conflict resolution (Jordan & Lawrence 2009, 5-6).

Effective management of own emotions, including regulating disruptive feelings and maintaining integrity, is essential for fostering trust and innovation within virtual teams. Managers equipped with strong self-regulation skills are better positioned to address trust, adaptability, and change challenges in virtual environments, ultimately enhancing overall team performance by fostering trust, embracing change, and promoting innovation. (Birwatkar 2014, 118-119)

According to Jordan and Lawrence (2009, 6), Awareness of Others' Emotions encloses the major skill of recognizing emotional displays and detecting false expressions through signs such as facial expressions and body language. This ability plays a vital role in team performance, as proved by research supporting its significant influence on goal

achievement and team cohesiveness, highlighting its importance in promoting effective interpersonal interactions within teams. Realizing and analyzing the sequence of emotions enables teams to tackle negative reactions effectively, highlighting the significance of emotional awareness in optimizing team dynamics and performance. (Jordan & Lawrence 2009, 6-7)

Birwatkar (2014, 120) stated that recognizing and empathizing with others' emotions, known as awareness of others' emotions, is vital in virtual team dynamics, as it enables understanding of team members' views and needs. Managers adept in empathy can better determine the developmental requirements of their team, nurturing healthy interpersonal relationships and fostering collaboration in virtual environments, thus creating a supportive and inclusive atmosphere that enhances overall team performance.

Management of Others' Emotions involves the skilled handling of team members' emotional responses, vital for maintaining successful working relationships within teams. Responding carefully to emotional events, such as anger, by allowing individuals to express their feelings and then facilitating constructive discussions, can lead to resolution and enhance team cohesion. (Jordan & Lawrence 2009, 6) Studies indicate that promoting positive emotions like enthusiasm among team members raises emotional resonance, resulting in increased positive interactions and motivation within the team, eventually contributing to improved team performance (Jordan & Lawrence 2009, 6-7).

Proficiently managing others' emotions, as captured in the concept of "Management of Others' Emotions", is important for effective leadership within virtual teams, requiring expert social skills covering teamwork and adaptability. Managers who excel in these areas can skillfully navigate the particulars of virtual team dynamics, cultivating constructive relationships and adapting to evolving business landscapes, thereby leveraging open communication, healthy relationships, and constructive feedback to boost satisfaction, productivity, and overall team performance in virtual settings. (Birwatkar 2014, 121)

Emotional intelligence enhances collective work dynamics, fostering collaboration and effective communication among diverse team members. Teams with elevated emotional intelligence levels demonstrate heightened effectiveness, productivity, and adaptability, particularly in virtual work environments, thereby maximizing performance potential. (Quisenberry 2018, 26) Effective team performance

is closely linked to interpersonal skills and harmony among members, making emotional intelligence a pivotal factor. The cultivation of emotional intelligence within a team can lead to enhanced social interactions and ultimately contribute to improved team performance. (Chang et al. 2012, 76)

Team emotional intelligence, shaped by the collective emotional intelligence of its members fostered by team culture, enhances team synergy and relationships, thereby positively impacting performance. The relationship between team culture, emotional intelligence, and performance suggests that cultivating a supportive team environment can significantly improve outcomes, as emotional reactions within the team influence member attitudes and behaviors, ultimately contributing to overall performance. (Jamshed & Majeed 2019, 96)

According to Feyerherm and Rice (2002, 344), achieving optimal team performance hinges upon the cultivation of emotionally intelligent norms - those attitudes and behaviors that evolve into habitual practices, fostering trust-building, group cohesion, and collective efficacy. Emotional intelligence fosters a cooperative atmosphere within teams, facilitating coordinated interactions and maintaining positive relationships, thereby enhancing overall performance and cohesion. Moreover, a team's emotional intelligence facilitates the free exchange of ideas and information, fostering open discussions among members and promoting innovation as a result. (Lee & Wong 2019, 13)

Studies on team emotional intelligence among university students have found that individual members' emotional intelligence scores are combined to compute an average team score, which has shown correlations with various team performance metrics. For instance, research by Jordan et al. (2002) revealed that higher levels of overall emotional intelligence within self-directed student teams at an Australian university were associated with increased team process effectiveness and goal focus, indicating its significance in team performance evaluation. (Frye et al. 2006, 49-50)

Teams with higher average emotional intelligence among their members tend to experience smoother interaction processes, leading to improved overall performance. Additionally, high emotional intelligence team members are better equipped to regulate the emotional atmosphere, allowing teams to focus on critical tasks and enhance cognitive

and decision-making processes, ultimately fostering higher performance through reciprocal relationship-building efforts. (Chang et al. 2012, 79)

Research indicates that leaders with high emotional intelligence positively influence team performance by effectively managing emotions, fostering creativity, resilience, confidence, and collaboration among team members. Furthermore, leaders with high emotional intelligence tend to exhibit supportive behaviors towards their team members, resulting in increased effort and contribution towards achieving collective goals, thus establishing a direct correlation between leader emotional intelligence and team performance. (Chang et al. 2012, 81)

Frye et al. (2006, 50) found that teams exhibiting higher levels of emotional intelligence demonstrated superior performance in problem-solving tasks and favored collaborative conflict resolution approaches. Observing that teams comprising individuals with strong emotional intelligence, particularly in self-management, tended to be more open to diverse perspectives and pursued optimal solutions without fear of criticism. These findings underscore the significance of individual emotional intelligence in shaping effective team dynamics, thereby influencing overall team performance. (Frye et al. 2006, 50)

In distributed groups, compatibility, knowledge, and emotional health of members strongly predict shared goals and team performance. Emotional intelligence plays a pivotal role in selecting members for self-managed virtual teams, impacting team effectiveness and employee participation, and serving as a key factor for team development and higher performance levels among team members. (Murmu & Neelam 2022, 36-37) Furthermore, Murmu and Neelam (2022, 39) argued that emotional competency among team members, encompassing skills like influencing, empathy, and achievement orientation, positively influences team cohesion and performance in virtual settings, fostering new mindsets that enhance staff targets and elevate overall performance.

These studies offer unique insights into the specific challenges faced by virtual teams and the critical role of emotional intelligence in addressing these challenges to improve team performance. Scholars have extensively explored the relationship between emotional intelligence and team performance across varied professional contexts, encompassing both physical and virtual work environments and spanning individuals

from academia as well as diverse industries like manufacturing, finance, and education. Employing diverse analytical methodologies, ranging from qualitative inquiries to advanced statistical techniques such as Hierarchical/Multiple Regression Models and Confirmatory Factor Analysis, these studies meticulously consider demographic variables like gender and age.

For example, Murmu and Neelam (2022) employed multiple linear regression (MLR) to explore the positive correlation between emotional intelligence and team performance within virtual teams. However, their study did not extend to encompassing global virtual teams' (GVTs). In contrast, Shafique and Naz (2023) utilized regression analysis to establish a positive association between team emotional intelligence and team performance, specifically within the realm of construction projects.

In this research, global teams participate in a series of consulting projects within a virtual setting, where effectively understanding and managing emotions - both personal and those of team members - during digital meetings requires significant time and effort. This challenge, coupled with the demand for high-quality deliverables to enhance team performance, underscores the need to examine the direct correlation between emotional intelligence and the performance of global virtual teams' (GVTs). Consequently, the following hypotheses are formulated.

Hypothesis H2: Team emotional intelligence is positively associated with global virtual teams' (GVTs) performance.

Birwatkar (2014, 118-119) and Feyerherm & Rice (2002, 344) emphasize that building trust within teams requires several emotional intelligence competencies. These include understanding others' expressions, sensing their emotions, being aware of one's own behavior, and adapting behaviors accordingly. This discussion naturally leads to a deeper examination of how trust enhances team performance in the following section.

2.2.4 Trust

Trust is a collective psychological condition defined by a willingness to embrace vulnerability, rooted in the anticipation of the intentions of fellow team members. (Gibson & Cohen 2003, 12) Trust "increases confidence and security in the relationship, reduces transaction costs between parties, and promotes open, substantive, and influential information exchange" (Jarvenpaa et al. 1998, 30).

Trust plays an indispensable role within organizations that rely on cross-functional teams, temporary work groups, and other cooperative structures to effectively coordinate work processes. Particularly in group or team settings, trust entails confidence in the reliability and competence of fellow members, fostering an environment where individuals depend on each other's integrity and capabilities to accomplish tasks effectively. (Krebs et al. 2006, 723)

Hakanen et al., (2015, 45) underscore the theoretical challenge in defining trust, referencing Coleman (1990), who characterizes it as a commitment to cooperation despite uncertainty regarding trusted individuals' actions, and Fukuyama (1996), who conceptualizes trust as the anticipation of honest conduct. Trust encompasses a risk derived from anticipated behavior, as noted by Costa (2003) in observations of interpersonal interactions, and can also be evaluated through probability calculations, as discussed by Tyler and DeGoeij (1996), where the potential benefits and drawbacks of engagements are assessed (Hakanen et al. 2015, 45).

Various disciplinary perspectives offer diverse definitions of trust. Through synthesizing these definitions, Rousseau, Sitkin, Burt, and Camerer (1998) discovered a common thread among scholars: trust is identified as a psychological state characterized by the willingness to embrace vulnerability, driven by optimistic expectations regarding the intentions or conduct of another individual. (Sonnenwald 2004, 82) McAllister (1995, 25) argues that trust within organizations comprises cognition-based trust, rooted in individual perceptions of peer reliability and dependability, and affect-based trust, grounded in reciprocal interpersonal care and concern.

Cognition-based trust, as portrayed by Rempel et al. (1985), is primarily characterized by an assessment of technical competency and predictability, underpinned by rational evaluation, available knowledge, and substantive reasons, as suggested by Jeffries and Reed (2000). In simple words, cognitive trust stems from rational assessment, rooted in the head, evaluating ability and reliability (Blanding 2011).

Conversely, affect-based trust, as illuminated by Lewis and Weigert (1985), finds its foundation in emotional attachment and the development of emotional bonds between individuals, where individuals invest emotionally in relationships and demonstrate genuine care and concern for the well-being of their partners. (Lee et al. 2010, 1175) In

layman's terms, affective trust, emerging from the heart, entails significant emotional investment (Blanding 2011).

Trust, as evidenced, serves as a predictor of both individual behavior and team performance (Killingsworth et al. 2016, 287). Trust is widely recognized as a crucial element within high-performing teams, aligning with McFadzean's (2002) contention that well-established high-performance teams often exhibit strong levels of trust between leaders and team members (Chong 2007, 212). Trust lies at the foundation of high-performing teams, facilitating elevated engagement, creativity, and productivity among employees. Consequently, prioritizing the cultivation of trust emerges as a critical directive for leaders striving to cultivate a high-performance team, with enhanced transparency serving as a catalyst for creativity, performance, and profitability. (Friedman 2024)

De Jong et al. (2016, 33-34) demonstrate that trust significantly influences team performance, with intrateam trust uniquely quantifying performance outcomes beyond other key factors and displaying consistency across various dimensions of trust. According to recent meta-analyses, both cognitive and affective dimensions of trust exert a comparable influence on team performance. However, these analyses underscore that each dimension significantly contributes to performance individually. (Feitosa et al. 2020, 3)

In the realm of virtual organizations, fostering a culture of trust emerges as a fundamental cornerstone, indispensable for cultivating cohesive networks, facilitating the formation and efficacy of virtual teams, and ultimately, breaking down the barriers inherent within both intra- and interorganizational spheres (Krebs et al. 2006, 724). Consequently, virtual teams typically necessitate a greater investment of time compared to their non-virtual counterparts for the cultivation of trust and the establishment of positive social connections (Zhu & Lee 2017, 31). As highlighted by O'Hara-Devereaux and Johansen (1994, 243), "Trust is the glue of the global workspace", particularly within a virtual environment.

Trust is crucial for effective management and leadership in both global virtual teams' (GVTs) and virtual teams in general, as it reduces communication costs and the need for employee monitoring, especially in multinational corporations operating across

multiple countries. Group members' trust enhances job satisfaction, promotes information sharing, and improves overall performance outcomes. (Zhu & Lee 2017, 32)

Murmu and Neelam (2022, 34) stress that improving virtual team performance significantly hinges on cultivating trust among team members, achieved through a deep understanding of individual emotions and personalities, coupled with encouragement towards leadership roles, thereby fostering a sense of confidence and cohesion, ultimately enhancing overall team performance in virtual environments.

Kauffmann and Carmi (2014 207) highlight the role of trust in both short-term and long-term virtual team dynamics with respect to affective and cognitive trust. Short-term teams, such as project-based or task-oriented groups, rely heavily on swift trust theory, emphasizing cognitive elements like role-based interaction and category-driven information processing to quickly establish trust. Conversely, long-term teams, characterized by ongoing collaboration and recurring activities, require the development of both cognitive and affective trust dimensions, with a greater emphasis on affective trust to foster enduring interpersonal relationships throughout the team's lifespan. (Kauffmann & Carmi 2014, 207)

Trust plays a focal role in the success of global virtual teams' (GVTs), notably altering their performance in achieving goals, maintaining quality, meeting deadlines, and adapting to changes. (Gibson & Cohen 2003, 61) Trust is chief for virtual team performance, markedly shaping its usefulness, as evidenced by studies indicating a strong association between trust among members and improved team performance - a relationship even more noticeable in virtual environments. (Murmu & Neelam 2022, 36)

According to Gibson and Cohen (2003, 61), within virtual collaborations, the challenge lies in identifying and cultivating trust, which becomes increasingly crucial as traditional means of social control and psychological safety are often limited in the virtual environment. Murmu and Neelam (2022, 36) contended that individuals' willingness to engage with their teammates on critical tasks reflects the depth of trust in their colleagues' anticipated behaviors, particularly crucial amidst cultural and temporal disparities inherent in global virtual teams' (GVTs). This underscores the heightened significance of trust in enhancing team performance.

In the realm of Affective Trust and Cognitive Trust, cognitive trust relies on competence and cooperation, while affective trust thrives on personal connections, both playing crucial roles in enhancing virtual team performance through different mechanisms of coordination and collaboration. Cognitive trust fosters coordination within virtual teams, positively impacting team performance by enhancing understanding and alignment among members; conversely, affective trust, rooted in personal relationships rather than competence, creates a safe environment where team members feel comfortable sharing information, leading to increased collaboration and task ownership, thereby boosting virtual team performance. (Robert Jr 2016, 247-248)

Morrisette and Kisamore (2020, 2) conducted a comprehensive meta-analysis focusing on the relationship between trust and performance within business teams. Their study, based on data pooled from 55 independent studies encompassing 3,671 teams, revealed a substantial positive correlation between team trust and performance in real-world business settings. The teams were classified according to team type taxonomies, including decision-making teams (e.g., top management teams), production teams (e.g., manufacturing teams), and project teams (e.g., new product development teams). (Morrisette & Kisamore 2020, 10) Notably, the research did not explore concepts such as remote teams, virtual teams, or global teams.

In contrast to the focus of Morrisette and Kisamore's (2020) study, the present research centers on the dynamics of trust within global virtual teams' (GVTs), a distinctive context that warrants specific attention. Zettinig et al. (2022) provide insight into the unique characteristics and settings of these teams. In their study, multinational teams consisting of students from five international universities collaborate virtually to address various International Business (IB) strategy challenges. These teams operate across different countries within varied sociocultural and organizational settings, engaging in virtual collaboration on IB strategy projects. (Zettinig et al. 2022, 1-3) This delineation highlights the multinational and virtual nature of the teams under investigation, distinguishing it from previous studies.

Erdem and Ozen (2003, 132-133) examined the interplay between the affective and cognitive dimensions of trust within teams and its impact on team performance using Pearson correlation coefficients. Their study involved 50 teams selected from 10 firms across various industries, including automotive, metals, electronics, and textiles, with a

total of 279 team members providing completed responses to questionnaires. The findings underscored a robust positive relationship between the affective and cognitive dimensions of trust, characterized by attributes such as ability, integrity, and demonstration of concern and benevolence among team members. (Erdem & Ozen 2003, 132-133) This trust dynamic was associated with indicators of team performance, including effective planning, problem-solving abilities, and sustained improvements in quality. Specifically, as the levels of affective and cognitive trust among team members increased, there was a corresponding enhancement in performance metrics related to planning, problem-solving, and quality improvement. (Erdem & Ozen 2003, 132-133)

Erdem and Ozen's (2003) exploration of the interplay between affective and cognitive dimensions of trust and its impact on team performance provides a foundation for understanding trust dynamics. However, the present research extends this inquiry by examining trust dynamics within the specific context of global virtual teams' (GVTs). In global virtual teams' (GVTs), factors such as digital communication technologies and cross-cultural collaboration introduce unique challenges and opportunities. Therefore, by integrating insights from studies such as Morrissette and Kisamore (2020) and Erdem and Ozen (2003) within the context of global virtual teams' (GVTs), this research aims to contribute to a nuanced understanding of trust dynamics and their implications for team performance in present-day organizational settings.

In this study, team members from global universities collaborated on a series of consulting projects within virtual settings, utilizing digital communication technologies such as Zoom Video Communication. Establishing trust within this global virtual environment and managing projects across various time zones for approximately two months poses a significant challenge. Cultivating trust in these settings is crucial for enhancing team performance. To substantiate and advance this argument, the following hypothesis has been formulated.

Hypothesis H3: Trust is positively associated with global virtual teams' (GVTs) performance.

Friedman (2024) put forth the notion that trust serves as the cornerstone of high-performing teams, fostering an environment favorable to elevated levels of creativity. With this perspective in mind, it is imperative to delve deeper into the dynamics of team creativity and its significant contribution to overall team performance.

2.2.5 Team Creativity

Creativity has perpetually been the vital essence at the heart of every business endeavor (Amabile & Khaire 2008). The significance of fostering creativity within organizations for enhancing their adaptability to swiftly evolving and demanding environments is universally acknowledged (Mo et al. 2019, 229). Creativity, essential for innovation, growth, adaptability, and resilience, is prioritized by governments, corporations, educational institutions, and individuals who invest significantly in fostering divergent thinking and related practices, such as combinatorial play, design schooling, brainstorming, and innovation forecasting (Fletcher & Benveniste 2022, 29).

Reiter-Palmon (2017, 42) cited Amabile (1988) and Shalley et al. (2015) to define creativity in organizations as the generation of something new and useful, regardless of its connection to products, processes, or services. Capozzi et al. (2011) suggest that both individuals and teams can cultivate creative abilities, enhancing their capacity to produce groundbreaking ideas that drive progress and elevate performance.

Team creativity differs from individual creativity in that it hinges on collaborative efforts where members collectively generate innovative ideas, subjecting them to critical evaluation to discard unpromising ones and implement those showing potential. The cultivation of team creativity relies on pivotal interactive processes including the exchange of perspectives and knowledge, counteracting conformity tendencies, embracing risk-taking, and challenging both supervisors and peers. (Mo et al. 2019, 229)

Amabile (1996, 1) suggests that creativity is typically associated with inherently creative individuals, involving the generation of fresh and practical ideas across various domains. Rego et al. (2007, 250) underscore that for an idea to be deemed creative, it must embody both novelty and utility, underscoring the importance of blending originality with practicality in innovation.

Throughout history, creativity has been perceived as an elusive force, but scholars in creativity studies have attempted to distil it into measurable components. A commonly accepted definition characterizes creativity as the capacity to produce original ideas with practical utility. (Fletcher & Benveniste 2022, 30) The increasing acknowledgment of creativity as pivotal to organizational sustainability underscores the necessity of creative problem-solving, adaptation, and innovation to prevent obsolescence. This heightened

recognition has led to a growing emphasis on creativity within management research and practice, particularly highlighting the significance of team creativity over individual contributions, supported by evidence indicating teams often yield more impactful creative outcomes. (Reiter-Palmon 2017, 41) .

Building upon previous research, Farh et al. (2010, 1) delineated team creativity as the generation of innovative and practical concepts encompassing products, services, methodologies, and protocols, achieved through collaborative efforts of a group of employees. Reiter-Palmon (2017, 42) underscored team creativity as the collaborative generation of innovative outputs by interdependent individuals who collectively assume responsibility for the team's product. Pirola-Merlo and Mann (2004) posited that team creativity is a culmination of individual creativity, which evolves through interactions and processes among team members, suggesting it can be quantified as either the average or a weighted average of individual creative contributions (Yoon et al. 2010, 251).

According to Stahl et al. (2010, 3), team creativity is a pivotal element in fostering innovation, and it plays a significant role in determining overall team performance. Fostering a culture of high team creativity, characterized by continual exchange of perspectives and knowledge, proactive efforts to mitigate collective conformity, willingness to take risks, and constructive challenges to authority and peers, is instrumental in enhancing overall team performance (Mo et al. 2019, 231).

Taggar (1997, 20-21) demonstrated through statistical analysis that the intelligence of individual team members positively correlates with their peer-assessed creativity, thereby indicating that teams composed of more intelligent members tend to exhibit higher levels of creativity; consequently, as the average creativity within a team increases, as determined by the collective peer-assessed creativity scores of its members, the overall performance of the team improves. Furthermore, Bell et al. (2011, 713) highlighted that greater variety in team composition, characterized by diverse functional backgrounds, enhances access to varied pools of information and resources, fostering higher team creativity and ultimately leading to improved team performance, particularly in tasks demanding creative solutions.

Yoon et al. (2010, 259) emphasize that simply fostering a learning culture, while beneficial, is inadequate for ensuring optimal team performance, advocating instead for organizations to actively cultivate creativity within teams. This strategic focus on team

creativity plays a crucial role in enhancing collaborative knowledge creation practices and ultimately improving overall team performance. Consequently, the presence and extent of team creativity significantly influence the efficacy of team performance. (Yoon et al. 2010, 251)

According to Reiter-Palmon et al. (2021, 169), improved virtual team performance is closely connected to the advancement of communication methods, as the shift from textual interactions to audio and video conferencing enhances the potential for completing tasks driven by creativity. The movement towards more sophisticated communication platforms cultivates an atmosphere where team creativity emerges as a crucial catalyst in effectively addressing intricate challenges and achieving peak performance (Reiter-Palmon et al. 2021, 169).

In modern organizations, virtual teams have taken on the responsibility for creative endeavors as routine tasks become increasingly automated. This shift has prompted a growing research focus on creativity within virtual teams. (Chamakiotis et al. 2010, 1041) Recognized as both a prerequisite and a primary goal, fostering creativity among team members not only enhances virtual team performance but also leverages the diversity inherent in virtual teams to deliver distinct benefits, particularly in design practice (Chamakiotis et al. 2010, 1041).

On one hand, El Idrissi and Fourka (2022, 4) mention that virtual teams exhibit rich diversity in backgrounds, including cultural, professional, and organizational distinctions, fostering an environment ripe for creativity and innovation. Leveraging these varied perspectives can significantly enhance team performance in virtual settings (El Idrissi & Fourka 2022, 4).

On the other hand, Algesheimer et al. (2011, 4) state that a larger, diverse virtual team possesses an expanded reservoir of cognitive resources, facilitating heightened levels of knowledge, creativity, and performance. The substantial benefits of team heterogeneity underscore the pivotal role of diverse skill sets and knowledge in bolstering team functionality, particularly within competitive landscapes that demand creativity and seamless data integration, thereby enhancing virtual team performance (Algesheimer et al. 2011, 20).

Global virtual teams' (GVTs), leveraging the diverse perspectives and resources of their members, possess the potential to significantly enhance creativity and problem-solving, thereby ultimately improving team performance (Taras et al. 2019, 2-6). Encouraging creativity and facilitating change, along with providing personalized consideration for team members, enhances member satisfaction and overall performance within global virtual teams' (GVTs) (Fernandez & Jawadi 2015, 1695).

Yoon et al. (2010, 253) investigated how supportive learning culture, team creativity, and collaborative knowledge creation practices influence team performance, framing research question as the extent of these factors' direct and indirect impacts. Their study involved 228 knowledge workers from various Korean profit-business organizations, representing industries reliant on intangible assets and specialized market knowledge. The data collection was facilitated by a human resource manager from a major Korean motor company, who distributed surveys through the organizations' intranet. (Yoon et al. 2010, 253)

Utilizing structural equation modelling (SEM), the researchers found significant associations: team creativity positively affected collaborative knowledge creation practices and perceived team performance. They concluded that fostering team creativity alongside a learning culture is imperative for enhancing collaborative knowledge creation practices and ultimately ensuring effective team performance. (Yoon et al. 2010, 259) The study notably did not investigate concepts such as remote teams, virtual teams, or global teams.

In this study, teams are engaged in a series of consulting projects focused on the internationalization of businesses. The success of these projects relies on the creative outlook of team members and the innovative thought processes driving new idea generation and creative problem-solving. However, achieving this level of performance is challenging within a global virtual team (GVT) setting. To further explore this dynamic, the following hypothesis is proposed.

Hypothesis H4: Team creativity is positively associated with global virtual teams' (GVTs) performance.

Thus far, scholarly research has demonstrated that team emotional intelligence promotes trust among team members, subsequently fostering a collaborative culture and

enhancing the team's creativity, thereby contributing to improved team performance. This establishes a foundation for further exploration of the collaborative culture as another pivotal factor in enhancing team performance.

2.2.6 Collaborative Culture

Culture stands as a company's single most powerful advantage. In various research fields, diverse definitions of culture abound, yet a prevailing consensus underscores its learned nature, entwined with shared values, beliefs, and behaviors within a group, often transmitted across generations (Fazli & Bittner 2017, 455). Culture encompasses a multitude of dimensions, spanning practices, symbols, norms, rituals, ceremonies, beliefs, and values (Laker 2021).

Culture within an organization constitutes its implicit social framework, profoundly influencing attitudes and behaviors. Cultural norms dictate the acceptance, rejection, encouragement, and discouragement of actions, ultimately harnessing collective energy towards a common goal and enhancing the organization's resilience and success when harmonized with individual values and motivations (Groysberg et al. 2018, 4).

Culture, as articulated by Robbie Katanga as how organizations 'do things', serves as a vessel of significance, encompasses both "what is" and "why is", serving as the shared perspective and underlying narrative within an organization, defined by its values and rituals. Culture in organizations is a dynamic process of "sense-making", characterized by a collaborative effort to establish shared awareness and understanding from diverse perspectives and interests. (Watkins 2013)

Culture plays a crucial role in guiding individuals towards a collective understanding of "reality", thereby establishing a framework for aligning goals and promoting collaborative endeavors (Watkins 2013). Through collaboration, teams can harness empowerment, stimulate innovation, and convert obstacles into favorable prospects (Fernandez et al. 2024).

Collaboration emerges as a behavioral outcome within a collaborative culture, characterized by the adoption of specific values, principles, and behaviors that collectively not only encourage collaboration but also foster an environment where collaboration is anticipated and upheld (Sanchez 2012, 7). Chiochio et al. (2012, 12)

defined collaboration as “the interplay of situation-appropriate uses of four interrelated processes: teamwork communication, synchronicity, explicit coordination, and implicit coordination”.

Evan Rosen articulated that collaboration is the process wherein individuals work together within shared virtual or physical spaces to create value collaboratively. Effective collaboration transcends technology and relies on a culture of sharing and teamwork, whether through traditional means like paper and pens or modern digital platforms, emphasizing the importance of fostering a collaborative culture for successful outcomes. (Hastings 2009, 7)

Collaborative culture emerged as a paramount organizational asset, demonstrating significant influence on innovation capabilities. Recognized for its cost-effectiveness and potential, collaborative culture serves as both a fundamental survival strategy and a pivotal driver of innovation within organizations. (Shehzad et al. 2022, 1425)

A collaborative culture serves as a catalyst for cultivating an innovative environment characterized by creativity, risk-taking, and growth. By encouraging open debate and experimentation with creative ideas and methods, collaborative cultures significantly enhance employees’ innovation capabilities, potentially inspiring them to overcome resource limitations to deliver high-quality goods or services. (Shehzad et al. 2022, 1427)

Lopez et al. (2004, 96) decided a collaborative culture within an organization is characterized by a strategic focus on long-term vision and proactive change management, fostering open communication and dialogue channels, cultivating trust and respect towards all individuals, promoting effective teamwork and empowerment of employees, embracing ambiguity tolerance and risk assumption as part of innovation processes, and actively encouraging respect for diversity to create an environment conducive to organizational learning and growth.

Guerra et al. (2005) emphasized that collaborative culture thrives by fostering people-oriented values such as cooperation, mutual trust, and team spirit (Ahmed et al. 2016, 338). Collaborative culture significantly boosts innovation by fostering employee collaboration and supportiveness, facilitating the transformation of tacit knowledge into

explicit information, enabling the identification and communication of knowledge gaps, and ensuring information accessibility and relevance (Shehzad et al. 2022, 1429).

Collaborative cultural values create an environment wherein organizational members are empowered to harness learning and experiences by recognizing diverse knowledge sources, thus enabling them to innovate and execute activities in novel and effective ways, ultimately enhancing team performance (Ahmed et al. 2016, 340). Enhancing competitive performance necessitates a collaborative culture that evolves the organization's norms and mindset through continual learning and adaptation (Lopez et al. 2004, 93).

Barney highlighted the pivotal role of organizational culture as a catalyst for fostering sustained competitive advantage, emphasizing that cultivating a collaborative culture enables firms to engage in transformative activities, ultimately leading to sustained superior performance, as cultures lacking these attributes tend to lack rarity and imitability (Barney 1986, 666). Katzenbach et al. (2013, 66) point out that enhancing team performance is contingent upon two key practices: the cultivation of skills pertinent to collaborative behavior and fostering an environment conducive to informal community building.

Investing in a collaborative culture, wherein employees are empowered to contribute to a shared vision and understand the broader objective of their work, significantly enhances both individual and team performance, fostering long-term organizational success. By prioritizing the cultivation of trust, communication, and a unified sense of objective, HR and talent management professionals can establish a collaborative organizational culture that yields improved employee retention, reduced conflict, enhanced competitive advantage, and heightened team performance levels. (Kelly & Schaefer 2014, 7)

Organizations that embrace values such as trust, cooperation, open communication, and diversity foster a collaborative culture, thereby establishing an early reputation for creativity and achieving superior team performance (Ahmed et al. 2016, 338). Pérez Lopez et al. (2004, 97) concluded that organizational learning exhibits a positive correlation with organizational performance, indicating that collaborative culture not only fosters organizational learning but also enhances overall performance, thus underscoring the significant impact of collaborative culture on the process of

organizational learning, which in turn contributes to improved organizational performance.

Achieving collaboration in a virtual workplace presents heightened challenges, particularly when team members originate from diverse companies, lack prior acquaintance, and possess varying cultural and professional backgrounds (Ferrazzi 2012). Fostering a collaborative culture becomes paramount in enhancing virtual team performance amidst such complexities. Cagiltay et al. (2015, 1-16) observed that in environments characterized by diverse cultural backgrounds, leveraging sophisticated information and communication technology for collaborative endeavors holds promise for enhancing team performance and fostering cross-cultural comprehension among individuals from various countries.

Precup et al. (2006, 79-80) delineated three primary modes of virtual collaboration: Asynchronous collaboration, Distributed synchronous collaboration, and Distributed asynchronous collaboration. Asynchronous collaboration encourages teamwork via platforms like organizational notice boards, enabling members to engage at their convenience. Distributed synchronous collaboration employs real-time technology, such as telephony and video conferencing, to facilitate seamless information exchange among geographically dispersed team members, while Distributed asynchronous collaboration utilizes tools like email and voice mail to effectively share explicit knowledge across various locations and time zones. (Precup et al. 2006, 79-80)

Morrison-Smith and Ruiz (2020, 8) asserted that virtual teams, characterized by geographically dispersed collaborations facilitated by technology, possess numerous advantageous aspects, particularly in fostering a collaborative culture and enhancing performance through both synchronous and asynchronous interactions toward shared objectives, similar to co-located teams. Karoui et al. (2010, 2) underscored that from a technological perspective, the efficacy of collaboration within virtual teams hinges upon the judicious selection of digital platforms for facilitating online interactions, addressing the critical challenge of choosing appropriate online tools conducive to fostering a collaborative culture essential for achieving optimal team performance.

Watson et al. discovered that while culturally homogeneous teams initially exhibited more effective interaction processes and superior performance, culturally heterogeneous teams demonstrated the capacity to catch up and ultimately surpass

performance levels, particularly when afforded the opportunity to foster development over time. (Hung & Nguyen 2008, 2). While Garro-Abarca et al. (2021, 2) noted that a study conducted in 2009, which encompassed 80 software teams operating globally, demonstrated that effectively managed virtual teams leveraging virtual collaboration have the capacity to surpass the performance of face-to-face (F2F) teams.

Brandon and Hollingshead (1999, 110) assert that the integration of collaborative learning and technology fosters mutual benefits, as collaborative learning shapes the online environment and technology facilitates access to resources, thereby enhancing team performance. This is further underscored by Romiszowski and Mason (2004, 400) who advocate for promoting extensive collaboration, such as through the utilization of discussion boards, to bolster virtual team performance.

Janutaite et al. (2015, 67) highlighted the critical role of communication in virtual group work, emphasizing that cooperation and collaboration among members are essential for achieving desired performance. Emphasizing that collaboration enhances team performance and innovativeness, the significance of fostering a collaborative culture within global teams is underscored. Blay et al. (2023, 7) mentioned that collaborative culture greatly influences team performance in virtual teams, where heightened collaboration correlates with enhanced task completion and team cohesion. The final level of collaborative behavior achieved by virtual team members is a pivotal factor, positively moderating the link between consensus on collaboration and team performance, reflecting a strong commitment to task accomplishment within highly collaborative virtual teams (Blay et al. 2023, 7).

Lopez et al. (2004) conducted a comprehensive investigation into the influence of collaborative culture on organizational learning and performance within a cohort of 195 Spanish firms. These firms, selected from a broader pool of 2740 entities spanning both industrial and service sectors, served as the focal point of their study. Utilizing a postal survey methodology, the researchers diligently collected data for subsequent analysis. Employing the robust analytical framework of structural equation modelling (SEM), their empirical findings revealed the pivotal role played by collaborative culture in fostering organizational learning, consequently exerting a significant impact on business performance.

Building upon the insights garnered from Lopez et al.'s seminal research, the current study endeavors to evaluate the performance dynamics of global virtual teams' (GVTs) engaged in multiple projects within a virtual global environment. The inherent challenge of nurturing a collaborative culture within such teams is exacerbated by the geographical dispersion of team members across disparate time zones. Furthermore, enhancing team performance through collaboration presents a formidable obstacle. To validate the impact of collaboration on the performance of global teams in virtual settings, the following hypothesis is formulated.

Hypothesis H5: Collaborative culture is positively associated with global virtual teams' (GVTs) performance.

The subsequent section provides a consolidated summary of hypotheses for streamlined reference and analysis. This centralized presentation aims to enhance clarity and facilitate comprehensive understanding of the proposed hypotheses.

2.2.7 Hypotheses Summary

In the ever-evolving landscape of modern organizations, the performance of global virtual teams' (GVTs) stands as a pivotal determinant of success. Understanding the sophisticated web of factors influencing global virtual teams' (GVTs) performance is imperative for organizations seeking to thrive in today's interconnected world. This section delves into the core hypotheses, synthesizing exploration, and drawing on established literature to illuminate the interplay between team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture in shaping global virtual teams' (GVTs) performance.

Team learning behaviors serve as the cornerstone of organizational adaptability and growth. Within the context of global virtual teams' (GVTs), this concept takes on added significance as dispersed teams navigate diverse cultural and linguistic landscapes. Edmondson's (1999) pioneering work on psychological safety underscores the importance of fostering an environment conducive to inquiry, feedback-seeking, and reflection. The integration of diverse perspectives and continuous learning fosters risk-taking and knowledge-sharing without fear of judgment within global virtual teams' (GVTs). This lays the groundwork for Hypothesis H1, which posits a positive association between team learning behaviors and global virtual teams' (GVTs) performance.

Emotional intelligence emerges as a critical determinant of team dynamics and performance in the contemporary workplace. Rooted in the ability to recognize and regulate emotions, emotional intelligence shapes interpersonal interactions and decision-making processes within teams. Quisenberry's (2018) framework highlights the multifaceted nature of emotional intelligence, encompassing dimensions such as awareness and management of one's own emotions, as well as the awareness and management of others' emotions. Within global virtual teams' (GVTs), where physical proximity is replaced by virtual connectivity, the ability to navigate complex emotional landscapes assumes heightened importance. Emotional intelligence elements are vital for team interactions and collaboration. Hypothesis H2 posits a positive relationship between team emotional intelligence and global virtual teams' (GVTs) performance, underscoring the role of emotional acumen in driving team effectiveness.

No tale of team dynamics is complete without trust. Effective teamwork cannot thrive without trust, the bedrock upon which collaborative endeavors are built. According to McAllister (1995), cognitive and affective dimensions of trust intertwine to create an environment characterized by reliability, dependability, interpersonal care, and concern. In the realm of global virtual teams' (GVTs), where geographical dispersion introduces unique challenges to interpersonal relationships, trust emerges as a linchpin of success. Building upon foundational research on trust in global virtual teams' (GVTs) contexts, Hypothesis H3 anticipates a positive association between trust and global virtual teams' (GVTs) performance, highlighting the pivotal role of trust in fostering peer reliability, dependability, and reciprocal interpersonal care and concern within virtual teams.

Exploration is further enriched by creativity, which also plays a crucial role in team dynamics. Amabile and Khaire (2008) identified creativity as the nucleus of every business endeavor. Farh et al. (2010) explained creativity as the generation of innovative and practical concepts that drive organizations toward novel solutions and competitive advantage. In the realm of global virtual teams' (GVTs), where diverse perspectives converge across virtual platforms, the collaborative creation of ideas, products, or services takes on added significance. Drawing upon insights from creativity research, Hypothesis H4 posits a positive association between team creativity and the performance of global virtual teams' (GVTs). By fostering a culture of experimentation and knowledge exchange, global virtual teams' (GVTs) unlock the full potential of their dispersed talent pool, driving creativity and adaptability in an increasingly competitive landscape.

Finally, collaborative culture emerges as the grand finale in the research journey, establishing itself as a strategic imperative in virtual team settings. Culture serves as the invisible thread binding teams together, shaping attitudes and behaviors towards shared goals. Within the context of virtual teams, cultivating collaborative behavior reflects a strong commitment to task accomplishment, as studied by Blay et al. (2023), and establishes an early reputation for creativity and superior team performance, as stated by Ahmed et al. (2016). Hypothesis H5 suggests a positive association between collaborative culture and global virtual teams' (GVTs) performance, highlighting the importance of collaboration in achieving success.

The above reflection on the proposed hypotheses is essential for grasping the core ideas and expectations driving the study forward. Each hypothesis is concisely stated below along with a hypotheses framework (see Figure 3), outlining the anticipated relationship or outcome under investigation. This framework functions as a roadmap for readers, providing a clear understanding of the research objectives. The hypotheses below propose that the independent variables - team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture - measure or explain the proportion of variability in global virtual teams' (GVTs) performance. In essence, the hypotheses summary plays a crucial role in presenting the scope and aim of the research.

Hypothesis H1: Team learning behavior is positively associated with global virtual teams' (GVTs) performance.

Hypothesis H2: Team emotional intelligence is positively associated with global virtual teams' (GVTs) performance.

Hypothesis H3: Trust is positively associated with global virtual teams' (GVTs) performance.

Hypothesis H4: Team creativity is positively associated with global virtual teams' (GVTs) performance.

Hypothesis H5: Collaborative culture is positively associated with global virtual teams' (GVTs) performance.

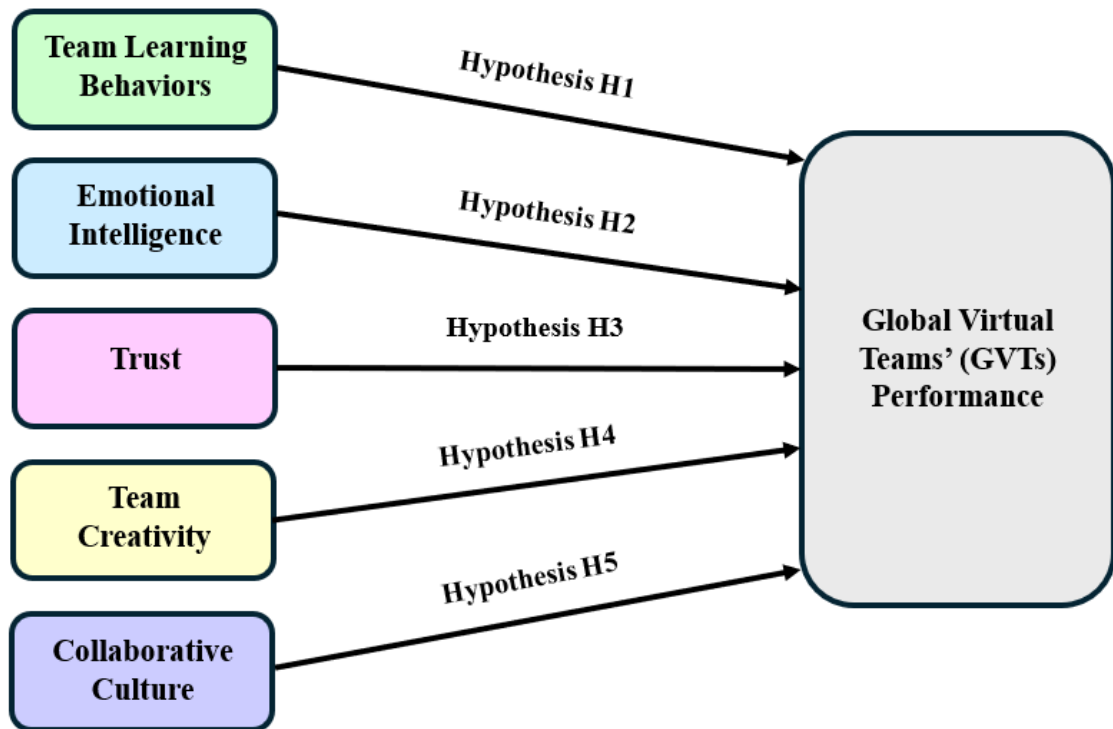


Figure 3. Hypotheses Framework

The hypotheses outlined above pave the way for thorough consideration into the sophisticated dynamics of global virtual teams' (GVTs) and their performance drivers. As the empirical journey to test these hypotheses begins, there is an expectation of uncovering valuable insights that contribute to a larger understanding of how team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture individually shape the performance of global virtual teams' (GVTs).

Through thorough statistical analysis and realistic findings, the aim remains to offer actionable recommendations for enhancing the performance of global virtual teams' (GVTs) in diverse institutional and organizational settings. Stay tuned for a deeper dive into the research findings in the subsequent sections, highlighting the association between individual variables and global virtual teams' (GVTs) performance.

The next section outlines the practical framework adopted to investigate the thesis topic "Quantifying Global Virtual Teams' (GVTs) Performance Variability" through quantitative research using a survey questionnaire approach. The methodology encompasses four key subsections: Research Design, Population and Sample, Data Collection Instrument, Data Analysis Technique, and Evaluation of Study.

3 Research Methodology

In this section, the research methodology employed in the study is broadly outlined, defining the approach, design, data collection methods, and analytical techniques used to study the thesis topic of “Quantifying Global Virtual Teams’ (GVTs) Performance Variability”. The methodology is configured into four subsections, each focusing on necessary aspects of the research process.

The quantitative research design chosen for this study is informed, highlighting its fitness for examining the relationships between variables pertaining to global virtual team performance. Furthermore, the rationale behind employing a survey questionnaire as the primary data collection method is justified, considering its effectiveness in gathering diverse views across dispersed global teams.

The population and sample section explain the target population as members of global virtual teams’ (GVTs), emphasizing the importance of accurate identification and clear characterization to align study findings with the intended audience. This section also features the sample selection process, including employed sampling techniques and considerations for sample size determination, to enhance the study’s credibility and relevance across diverse settings, ensuring representativeness and external validity.

The section on data collection instruments sheds light on primary data collection methods, particularly the survey approach, including the development process of the survey questionnaire and its administration via a web-based application. Furthermore, it provides an in-depth explanation of the variables featured in the survey, exposing their relevance to the study’s objectives. This section covers both the creation and usage of the survey instrument, as well as measures to maintain data integrity and participant privacy during data collection.

The chosen quantitative technique, simple linear regression, is rationalized in the Data Analysis subsection, emphasizing its appropriateness for analyzing the relationships between the dependent variable, global virtual teams’ (GVTs) performance, and the array of independent variables identified in the research hypothesis. Furthermore, the fitness and strength of this technique in developing meaningful insights from the collected data are discussed.

This structured approach to research methodology ensures clarity and accuracy in the study's execution, thereby enhancing the credibility and validity of the findings relating quantifying global virtual teams' (GVTs) performance variability.

3.1 Research Design

In the realm of quantifying global virtual teams' (GVTs) performance variability, the foundation of study resides in its research methodology, holding paramount importance. This comprehensive framework guides the systematic approach to resolving research problems, conducting investigations, and shaping outcomes.

According to Schwardt (2007, 195), "research methodology" as "a theory of how research should be carried out". Research methodology encompasses a systematic approach aimed at resolving research problems, serving as the framework through which the scientific process of conducting research is comprehensively examined and understood (Kothari 2004, 8). Put simply, research methodology guides researchers in how to conduct their studies, helping them define their problem, objectives, and present their findings based on collected data. This methodological approach leads to the creation of a research design, which serves as a structured framework for the study. (Sileyew 2019, 2). In relation to studying global virtual team performance, this methodological foundation facilitates the construction of a research design, offering a structured framework essential for navigating the complexities of investigating it.

The research design is fundamental in the pursuit of understanding and quantifying global virtual teams' (GVTs) performance variability. As Khalid et al. (2012, 19) emphasized, it encompasses crucial considerations such as the aim of the study, its location, type of investigation, extent of researcher involvement, time frame, and unit of analysis, with designs ranging from simple to complex depending on the study's nature and the formulated hypotheses for testing. This sentiment is echoed by Kothari (2004, 31), who defined research design as "the arrangement of conditions for the collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure". In the context of quantifying global virtual teams' (GVTs) performance variability, a meticulously crafted research design is essential. It serves as the conceptual charter guiding the collection, measurement, and analysis of data, from formulating hypotheses to their operational implications and the subsequent data analysis

(Kothari 2004, 31). As such, the research design acts as the blueprint for systematically investigating the factors influencing virtual team performance on a global scale.

Basias and Pollalis (2018, 92) affirmed that research, a systematic endeavor aimed at expanding knowledge and leveraging it to validate facts, address challenges, advance theories, and introduce novel solutions, spans across qualitative and quantitative research designs. The selection between these two approaches hinges on research objectives, the inherent nature of the subject matter, and the posed inquiries, guiding researchers in identifying, gathering, and scrutinizing data to deepen comprehension of a given topic (Basias & Pollalis 2018, 92).

Quantitative research fundamentally relies on the quantification of variables, focusing on the measurement of quantity or amount, and is particularly suited to phenomena that can be precisely expressed in numerical terms, while qualitative research is primarily concerned with the exploration of qualitative phenomena, which pertain to attributes such as quality or kind, emphasizing a deeper understanding of subjective experiences, behaviors, and perspectives rather than numerical measurements. (Kothari 2004, 3) Sells et al., (1995, 6) asserted that in quantitative research designs, a sequential structure is typically followed, progressing from hypothesis formulation, sampling, data collection, to data analysis and interpretation, whereas in qualitative research, interviews are typically transcribed, scrutinized, coded, and categorized iteratively throughout the study.

In the realm of quantifying global virtual teams' (GVTs) performance variability, quantitative research stands out as the apt choice for research design. Basias and Pollalis (2018, 92) underscore that quantitative methodologies, grounded in numerical measurements, are particularly well-suited for phenomena that can be precisely quantified, aligning seamlessly with the imperative to assess variables in comprehending global virtual teams' (GVTs) performance. As delineated by Kothari (2004, 3) and Sells et al. (1995, 6), this approach adheres to a structured progression from hypothesis formulation through to data analysis, providing a systematic framework for probing and validating explanatory factors influencing the performance of virtual teams.

Kothari (2004, 5) posits that quantitative research involves the systematic collection of numerical data for comprehensive analysis, typically organized into inferential, experimental, and simulation methodologies. The inferential approach aims

to derive population characteristics or relationships from sampled data, typically through surveys, while the experimental method involves controlled manipulation of variables to observe their effects. Simulation involves constructing artificial environments to generate data, allowing for the observation of dynamic system behavior under controlled conditions, which is particularly valuable for modelling future scenarios in business and social sciences applications. (Kothari 2004, 5)

Quantitative research designs necessitate either primary or secondary data collection, with some requiring both, and the modes of data collection vary depending on the research methodology, ranging from observation to surveys or utilization of secondary data sources (Khalid et al. 2012, 19). Synchronously, Sadan (2017, 58-59) asserted that quality data collection methods are integral to the quantitative research strategy, enhancing the accuracy and validity of study outcomes by adhering to a structured plan that dictates what data to collect, how to collect them, and the duration of collection.

Kothari (2004, 17) highlighted that primary data collection for quantitative research often involves experimentation or surveys. In the case of a survey, mailing questionnaires to respondents is extensively utilized, particularly in numerous economic and business surveys for collecting data (Kothari 2004, 100).

To quantify global virtual teams' (GVTs) performance variability through quantitative research, employing a primary data collection utilizing survey questionnaire method aligns well with the principles outlined by Kothari (2004, 17) and (Khalid et al. 2012, 19). Quantitative research involves systematic numerical data collection, often through surveys, aiming to derive population characteristics or relationships. The structured approach of survey questionnaires, including methods like online, ensures comprehensive data gathering, vital for accurate analysis and quantifying global virtual teams' (GVTs) performance variability. This aligns with the necessity for quality data collection methods emphasized by Sadan (2017, 58-59), enhancing the validity of outcomes in quantifying global virtual teams' (GVTs) performance variability.

In the forthcoming section 3.2, "Population and Sample", the discussion centers on the identification of the target population, which encompasses global virtual teams' (GVTs). Additionally, attention is given to the complexities of sample selection and size determination, with an emphasis on elucidating the methods utilized to ensure the representativeness and reliability of the obtained data.

3.2 Population and Sample

In the domain of exploring the dynamics of global virtual teams' (GVTs), the cornerstone of the study lies in the Population and Sample methodology, a critical component of the research framework. This methodological keystone is fundamental in guiding the systematic selection and analysis of participants, ensuring the robustness and validity of the findings.

The quantitative research design prioritizes the attainment of generalizability and reliability by seeking to extrapolate the relationships established among variables to the broader population, thus necessitating the careful selection of a sample that accurately represents the population under study (Delice 2010, 2002).

According to Levy and Lemeshow (2013), the population, also known as the universe or target population, represents the comprehensive collection of individuals from which survey findings are generalized. Within this population, individual members, referred to as elementary units or elements, serve as the subjects for measurement of characteristics. In simple words, the population refers to the comprehensive collection of potential observations, commonly referred to as cases, records, subjects, or data points, within a specified problem context. In numerous instances, the population size can be considerably large. (Kumar 2017, 35)

In the context of quantifying global virtual teams' (GVTs) performance variability, the target population comprises multinational teams. These teams consist of students from five international universities collaborating virtually to address a range of International Business (IB) strategy challenges through the organization, management, and leadership of global virtual teams' (GVTs) (Zettinig et al. 2022, 1). Situated across different countries and operating within varied sociocultural and organizational settings, these team members engage in virtual collaboration to undertake a series of IB strategy projects (Zettinig et al. 2022, 3).

The primary objective of quantitative research is to generalize its findings, often achieved through the use of samples rather than examining the entire population of interest. This approach enables efficient data collection, cost savings, and access to information that may otherwise be unattainable, facilitating broader inference-making. (Khalid et al. 2012, 20-21)

A sample is a subset extracted from a population, allowing for inferences about the broader population based on the sample data (Kumar 2017, 35). According to Fink, (2003, 1), a high-quality sample serves as a scaled-down reflection of the larger population it represents, mirroring its essential attributes on a smaller scale. An optimal sample achieves representativeness by ensuring that key characteristics, such as age and gender, are distributed within the sample in a manner consistent with their distribution in the broader population (Fink 2003, 1).

The procedure of selecting a subset from a population of elements, also known as observations or cases, is termed the sampling process, or simply sampling. The sampling process commences by first identifying the target population pertinent to the given problem under study, subsequent to which the sampling frame is established, outlining the source utilized for identifying the elements within the target population, leading to the determination of the sample size, which is subsequently followed by the selection of the appropriate sampling method. (Kumar 2017, 102)

The research design for quantifying global virtual teams' (GVTs) performance variability employs a quantitative approach, aiming for generalizability and reliability across the broader population of interest. To achieve this, a random sampling method, as defined by Shewhart (1931) as a "sample drawn under conditions such that the law of large numbers applies", is utilized to ensure that every case within the population has an equal chance of being selected, thus enhancing the representativeness of the sample (Kumar 2017, 103).

To address a series of consulting projects, students from various countries have united to form diverse teams, typically comprising individuals from five different nationalities, encompassing both genders, with minimal to no face-to-face interactions. The available survey data spans four years, and an overview of survey participation is provided below.

Across the years from 2020 to 2023, there was a fluctuating pattern in the organization of participants into teams, with 150 participants divided into 30 teams in 2020, followed by a decrease to 26 teams accommodating around 130 students in 2021, a further reduction to 18 teams with 85 participants in 2022, and ultimately an organization of approximately 110 students into 22 teams in 2023.

Table 4. Survey Participation Overview

Survey Year	Survey 1 Count	Survey 2 Count	Survey 3 Count	Survey 4 Count	Team Count
2020	144	138	137	133	30
2021	129	122	120	120	26
2022	85	83	82	84	18
2023	108	105	97	103	22
Total	466	448	436	440	96

The participant profiles of the global virtual teams' (GVTs) are notably diverse. With representatives from 41 different nationalities and 44 birth countries, as well as 43 native languages, the teams reflect a rich cultural tapestry. Women constitute 46% of the participants, and the median age is 25 years. Nearly half, or 46%, of participants juggle career or family responsibilities, while 61% are currently employed. A significant portion, 28%, hold executive or managerial positions, with an average work experience of 5 years. Interestingly, 58% of participants lack prior work experience in global virtual teams' (GVTs), underscoring the learning curve inherent in this mode of collaboration.

Table 5. Participant Profiles

Total Nationality Count	41
Total Birth Country Count	44
Total Native Language Count	43
Female Participants	46%
Participants' Median Age	25
Career/Family Responsibilities	46%
Participants Currently Employed	61%
Executive/Managerial Responsibilities	28%
Average Work Experience (Years)	5
No Previous Work Experience in GVT	58%
Median English Proficiency	Very Good (4/5)
Unique Standard Time Zone Count	10

Note: Numbers are rounded.

In realm to this research analysis, understanding population and sample characteristics is essential. Over the course of four years of surveys, the population consists of all participants who engaged in each survey annually. Across the four years, the total population count sums up to 466 participants for Survey 1, 448 for Survey 2, 436 for Survey 3, and 440 for Survey 4. The concept of team count emerges as an important subset within this population, with each survey consisting of a total of 96 teams.

For the analysis, Survey 4's team consists of 96 teams that serve as the sample encircling features of participant profiles. The sample for analysis is survey 4 incorporating 96 teams consisting of 440 individuals within the larger population. In essence, the population encompasses all survey participants across the years, with specific attention to the team count, where Survey 4's team count of 96 is utilized as a sample for analysis.

In the upcoming section 3.3, titled "Data Collection Instrument", thorough attention is devoted to revealing the development and validation procedures of the survey questionnaire utilized in this study. It meticulously presents the measures undertaken to ensure the questionnaire's reliability and validity, while also offering a comprehensive overview of the surveyed variables and their relevance to the research objectives.

3.3 Data Collection Instrument

In the investigation of global virtual teams' (GVTs) Performance, the focal point resides in the meticulous design and implementation of a survey questionnaire as the primary data collection instrument. This essential and operational core serves as the key player for systematically gathering insights into the dynamics of global virtual teams' (GVTs). Through its careful application, the integrity and reliability of study findings are ensured, contributing meaningfully to the understanding of virtual team dynamics.

According to Kothari (2004, 95), a data collection instrument functions as the medium through which information is systematically acquired, comprising primary data, inherently original and freshly collected, and secondary data, previously gathered by other entities and subjected to statistical analysis. Taherdoost (2021, 12) pointed out that primary data, originating from firsthand, unpublished sources untouched by alteration, boasts superior validity, reliability, objectivity, and authenticity compared to secondary data. These qualities are particularly crucial in research methods like statistical surveys,

where tailored, problem-specific information is essential and cannot be obtained from published sources.

Primary data collection involves two main approaches: experimentation, where researchers analyze quantitative measurements to validate hypotheses, and surveys, which provide diverse methods for gathering data. These methods encompass various approaches: observational methods, such as direct observation for real-time insights; personal interviews, which offer structured questioning and rely on interviewer skill; telephone interviews, particularly useful in time-sensitive industrial surveys; mailing questionnaires, widely adopted in economic and business surveys; and scheduling, wherein trained enumerators administer questionnaires in person, contingent upon their proficiency, with occasional field checks to ensure accuracy. (Kothari 2004, 17)

Sileyew (2019, 7) asserted that questionnaires stand as the primary instrument for acquiring primary information in practical research, affording researchers the flexibility to determine both sample selection and question types. A questionnaire is formally defined as a structured document comprising inquiries and other relevant items crafted to elicit information suitable for subsequent analysis (Acharya 2010, 2). In simple words, a questionnaire comprises a sequence of questions asked to participants to gather statistically significant data on a specific theme (Sarmah & Hazarika 2012, 508).

Ong (2012, 210) highlighted that the questionnaire emerges as a cornerstone in quantitative research methodologies, particularly in survey-based studies, serving as the predominant instrument for primary data collection. Employing a predetermined sequence of standardized questions for each respondent, this method efficiently gathers data from expansive samples, facilitating streamlined analysis and structured interpretation (Ong 2012, 210-211). Survey questionnaires offer cost-effectiveness, interviewer bias elimination, respondents' autonomy in answering, ample time for thoughtful responses, accessibility to less approachable respondents, and the potential for large, reliable sample sizes, particularly beneficial for extensive and geographically dispersed populations (Kothari 2004, 101).

A survey can be conducted utilizing a range of methods such as manual administration, phone interviews, or online platforms, particularly utilizing web-based survey (WBS) formats. (Santosa 2016, 339) Web-based surveys have gained traction as a cost-effective and widely utilized method for research, affording researchers the ability

to efficiently engage with a broad and geographically dispersed demographic. (Levi et al. 2022, 18)

Web-based surveys are increasingly recognized for their capacity to efficiently gather data from large sample groups at minimal cost, facilitated by streamlined processes from design to analysis and enhanced user-friendly interfaces. Incorporating web-based surveys alongside mixed-mode approaches has demonstrated potential to improve response rates, fostering more robust data analysis, a methodology substantiated across diverse populations and settings through extensive research. (Greenlaw & Brown-Welty 2009, 465)

In this research, survey participants comprise students from five international universities collaborating virtually on a series of consulting projects aligned with the International Business (IB) strategy course. Surveys are conducted following each assigned consulting project using the web-based survey tool, Webropol, which is employed for designing and distributing survey questionnaires among participants.

The first survey collects general demographic data and employs constructs to establish individual orientations, including individualism/collectivism (Triandis & Gelfand 1998), self-construal (D'Amico & Scrima 2016), psychosocial stress and well-being constructs (Pejtersen et al. 2010), decision-making styles (Scott & Bruce 1995), and individual initiative measures (Bolino & Turnley 2005).

Subsequent surveys utilize repetitive measures on selected team constructs, including psychological safety, team learning behavior, team learning outcomes (Edmondson 1999), emotional intelligence (Jordan & Lawrence 2009), trust (McAllister 1995), team creativity (Rego et al. 2007) and collaborative culture (Lopez et al. 2004). The survey questionnaires for constructs - team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture is detailed in [Appendix Survey Questionnaires](#).

The collection of survey data from students for the purposes of International Business (IB) strategy course is conducted with careful consideration of ethical standards and student consent. Students are made aware that their participation in the surveys is mandatory as part of the educational approach, yet they are provided with explicit

information regarding the utilization of their data and are given the opportunity to grant permission for its use.

The purpose of collecting student data is dual-fold. Firstly, it serves as a means for students to engage in reflective learning processes, gaining insights into their own development and teamwork dynamics. Secondly, it provides valuable data for academic analysis and research, aiding in the understanding of global virtual teams' (GVTs) dynamics and contributing to scholarly publications.

Students are informed about the storage and usage of their data through a detailed consent statement (See Appendix [Data Consent Protocol](#)). This statement outlines the various purposes for which the data will be utilized, including individual reflection, grading by course instructors, aggregate analysis by the coordinating team, and potential future research collaborations. Importantly, students are given the opportunity to withhold consent for certain uses of their data beyond course requirements.

The storage of student data is conducted in accordance with the guidelines of the University of Turku, ensuring confidentiality and security. Data is stored securely during collection and after completion of the course, with provisions for anonymization and eventual destruction after a specified period.

Furthermore, students are provided with the option to withdraw their consent for the use of their data beyond course requirements. This withdrawal process is clearly outlined, allowing students to maintain control over their personal information even after participation in the surveys.

Overall, the procedures for data collection, storage, and usage adhere to ethical standards and prioritize student consent and privacy. By transparently communicating these procedures to students, potential misunderstandings are mitigated, ensuring a respectful and responsible approach to data management in academic settings.

In the forthcoming "3.4 Data Analysis" section, the selection of simple linear regression is justified for examining the relationships between the dependent variable, global virtual team performance, and the identified independent variables. Moreover, the effectiveness of this technique in extracting meaningful insights from the data is evaluated.

3.4 Data Analysis Overview

In the pursuit of quantifying global virtual teams' (GVTs) performance variability, the crux lies in thorough data analysis, notably through the utilization of simple linear regression. By leveraging data collected from surveys, this analytical approach facilitates an in-depth exploration of the relationships between global virtual teams' (GVTs) performance and individual crucial variables - team learning behaviors, emotional intelligence, trust factors, team creativity, and collaborative culture.

Regression analysis stands as one of the paramount methodologies within the realm of data analysis (Gallo 2015). Regression analysis serves as a tool to investigate the presence of an association between the dependent variable, denoted as Y, and the independent variable, labelled as X, confirming that changes in the value of Y correspond with variations in the value of X. Simple linear regression, a statistical methodology, aims to ascertain the presence of an association between a dependent variable (also known as the response or outcome variable) and an independent variable (referred to as the explanatory or predictor variable), with the requirement that only a single independent variable is incorporated within the model. (Kumar 2017, 225)

Kumar (2017, 232) asserted that conducting descriptive analysis prior to constructing a simple linear regression model is consistently advisable, as it assists in comprehending the variability within the model and facilitates the visualization of the data. After data collection, statistical analysis generally commences with the computation of descriptive statistics, which encapsulate the distinctive attributes of the collected data, often presented through tables or graphs (Larson 2006, 76). Descriptive statistics, encompassing measures of central tendency, measures of variation, and measures of shape, offer valuable insights into the data (Kumar 2017, 32).

As per Holcomb (2016, 2), descriptive statistics serve the role of organizing and summarizing data, whether derived from studies of populations or samples. Kumar (2017, 35) stated that measures of central tendency, such as the mean, median, and mode, succinctly represent data with single values, serving as widely employed tools for comparing various datasets. Furthermore, Kumar (2017, 40) emphasized that a fundamental goal of analytics is to grasp the variability within data, a concept quantified through measures such as the range, inter-quartile distance, variance, and standard deviation. Lastly, Kumar (2017, 43-44) discussed measures of shape, including skewness

and kurtosis, where skewness evaluates the symmetry or asymmetry of a distribution, while kurtosis examines the shape of the distribution's tail, discerning whether it is heavy or light.

Gallo (2015) emphasized the importance of remembering a fundamental principle when conducting regression analysis or similar studies aimed at understanding how one factor affects another: Correlation does not imply causation. Correlation, a.k.a. correlation analysis, refers to the association or relationship linking two or more quantitative variables. The outcome of correlation analysis is a correlation coefficient ranging from 'minus 1' to 'plus 1', where a value of 'plus 1' indicates a perfect positive linear relationship between the variables, 'minus 1' denotes a perfect negative linear relationship, and zero indicates no linear relationship between the variables under study. (Gogtay & Thatte 2017, 78) Regression analysis may indicate a relationship between variables, yet it's crucial not to jump to conclusions. According to Redman, investigating real-world circumstances is essential for truly understanding the relationship identified through correlation (Gallo 2015).

Kumar (2017, 43-44) stressed that validating the simple linear regression model is crucial to ensure its suitability and accuracy for practical applications. Measures such as the coefficient of determination (R-Square), hypothesis testing for the regression coefficient, analysis of variance for overall model validity (more pertinent for multiple linear regression), residual analysis to verify regression model assumptions, and outlier analysis are employed for this objective (Kumar 2017, 43-44).

Simple linear regression is a suitable technique for quantifying the performance variability of global virtual teams' (GVTs) by systematically examining the relationship between the dependent variable, global virtual teams' (GVTs) performance, and each independent variable individually, such as Team Learning Behaviors, Emotional Intelligence, Trust, Team Creativity, and Collaborative Culture. This method facilitates determining the significance of each variable in influencing global virtual teams' (GVTs) performance and understanding their interaction within team dynamics. It allows for quantifying the impact magnitude of each independent variable on global virtual teams' (GVTs) performance, aiding in prioritizing interventions or improvements.

Additionally, simple linear regression helps identify critical variables shaping global virtual teams' (GVTs) performance, offering valuable insights for optimizing team

performance in virtual environments. This technique provides a clear understanding of the nature and direction of the relationship between each independent variable and global virtual teams' (GVTs) performance, enabling focused assessments of specific team dynamics and providing actionable insights. Furthermore, linear regression offers straightforward interpretations of coefficients, facilitating the easy and simple communication of findings and results.

In the upcoming "3.5 Evaluation of Study" section, we examine the criteria employed in evaluating quantitative analyses, addressing the pivotal aspects of validity, reliability, and generalizability. This discussion illuminates how these factors contribute to the accuracy and strength of the study's findings, enhancing its credibility and applicability to broader contexts.

3.5 Evaluation of Study

As per Morris and Burkett (2011), the appraisal of quantitative methodology's accuracy and strength is grounded on its validity, reliability, and generalizability (Mohajan 2020, 58). Assessment of quantitative analysis count greatly on accepted criteria - validity, reliability, and generalizability (Miyata & Kai 2009, 66). Validity relates to the degree of strength exhibited by research conclusions, inferences, or propositions. Cook and Campbell (1979, 37) defined it as the "best available approximation to the truth or falsity of a given inference, proposition or conclusion". (Miyata & Kai 2009, 67)

According to Kothari (2004, 73), validity stands as the paramount criterion, explaining the extent to which an instrument accurately measures its intended constructs. Put simply, validity represents the degree to which distinctions observed through a measuring instrument genuinely correspond to gaps among the subjects under examination (Kothari 2004, 73). The validity of quantitative research findings is typically segmented into three principal categories: criterion-oriented validity, content validity, and construct validity (Miyata & Kai 2009, 67).

Criterion-related validity, also referred to as predictive validity, pertains to the capability of measures or questions to produce precise predictions (Saunders et al. 2009, 429). Criterion-related validity concerns the capacity to forecast a particular outcome or assess the presence of a current condition. This type of validity indicates the effectiveness of measures employed for empirical estimation objectives. (Kothari 2004, 74)

In this research, the aim is to analyze the performance variability of global virtual teams' (GVTs) by investigating the impact of key variables, including team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture. The primary focus lies in examining how these independent variables individually relate to the dependent variable of global virtual teams' (GVTs) performance. To ensure the credibility of the findings, criterion-related validity is employed to assess the extent to which each variable separately quantifies the performance variability of global virtual teams' (GVTs) accurately. Through statistical analyses and interpretation of findings, valuable insights are provided in subsequent sections regarding the dynamics of global virtual teams' (GVTs) performance variability and contribute to the understanding of factors influencing their performance variability.

Content validity is confirmed through demonstrating that the test items represent samples from a universe of interest to the investigator. The researcher delineates this universe and systematically samples it to construct a framework (Miyata & Kai 2009, 67). According to Kothari (2004, 74), content validity refers to the degree to which a measurement instrument sufficiently encompasses the subject matter under investigation. When the instrument incorporates a representative sample from the entire universe, its content validity is deemed satisfactory (Kothari 2004, 74).

Content validity plays a pivotal role in ensuring that the survey questions accurately capture the dimensions of team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture within the unique context of global virtual teams' (GVTs) performance. The survey questions are carefully developed and reviewed to ensure relevance, clarity, and comprehensiveness for the study population, detailed in Appendix [Survey Questionnaires](#). Survey questionnaires directly address each independent variable, taking into account the unique challenges and dynamics of virtual team environments. By adhering to content validity standards, reliable and valid data are produced from survey questionnaires, contributing to a deeper understanding of global virtual teams' (GVTs) performance variability and the factors influencing it.

According to Saunders et al., (2009, 430), construct validity pertains to the degree to which your measurement questions accurately gauge the presence of the constructs you aimed to measure. Construct validity, the most complex and abstract form, is determined by the extent to which a measure aligns with anticipated correlations with other theoretical

propositions. It signifies the extent to which test scores can be attributed to the explanatory constructs within a robust theory. (Kothari 2004, 74)

Ensuring the construct validity of this research, titled “Quantifying Global Virtual Teams’ (GVTs) Performance Variability”, is paramount for its credibility, significance, and impact on the interpretation and generalizability of findings. Construct validity is of utmost importance as it ensures that the questionnaire effectively captures the underlying dimensions of team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture within the unique context of global virtual teams’ (GVTs).

To achieve this, each construct is carefully detailed in the literature section based on relevant literature and theoretical frameworks, translating these construct definitions into measurable variables through survey questions, as detailed in Appendix [Survey Questionnaires](#). By adhering to construct validity standards, robust and credible findings are produced, contributing to a deeper understanding of global virtual teams’ (GVTs) performance variability and the factors influencing it.

Another important criterion of a quantitative study, reliability, as defined by Nunnally (1978), encompasses the consistency of results over time and their fidelity to the entire study population. Put simply, if a study’s findings can be replicated using a similar methodology, the research instrument is deemed reliable. (Miyata & Kai 2009, 68) Reliability, offering consistency of measurement instrument scores across replications of the measurement procedure according to Brennan (2001), is fortunately a property of measurement that can be quantified and statistically evaluated (Cooper & Dent 2011, 129).

Ensuring reliability through consistent outcomes in measuring instruments, as highlighted by Kothari (2004, 74), is paramount for valid research. However, threats to reliability, such as participant errors and biases, as well as researcher errors and biases, can introduce inconsistencies, thereby jeopardizing both the reliability and validity of the research findings. Thus, while reliability is essential for valid measurement practices, addressing and mitigating these threats is equally imperative to maintain the integrity of the research process. (Saunders et al. 2009, 192)

Reliability, characterized by its consistency, emerges as a fundamental element in the validation of questionnaires, with Mitchell (1996) explaining the internal consistency

approach as a method for evaluating reliability by correlating responses to questionnaire items. (Saunders et al., 517-518) According to Vaske et al. (2017, 164-165), Cronbach's alpha serves as a prevalent metric for assessing the internal consistency or reliability of summated rating scales, reflecting the degree to which responses to scale items correlate.

The Likert technique is classified as a summated rating scale, where individual responses from each item are aggregated or averaged to derive the respondent's score on the scale (Vaske et al. 2017, 163). Internal consistency statistics assess the uniformity of responses across items within a scale, with the term "scale" encompassing a set of survey items designed to gauge an underlying concept, such as a summated rating scale (Vaske et al. 2017, 164). Cronbach's alpha statistics generate an alpha coefficient ranging between 0 and 1, with a threshold of 0.7 or higher indicating internal consistency among the aggregated questions within the scale (Saunders et al., 518).

Ensuring the reliability of data is paramount in "Quantifying Global Virtual Teams' (GVTs) Performance Variability", as it underpins the credibility and validity of the findings. Reliability assures the consistency and dependability of measurements, particularly vital in assessing variables such as Team Learning Behaviors, Emotional Intelligence, Trust, Team Creativity, and Collaborative Culture, and their impact on global virtual teams' (GVTs) performance variability.

To uphold reliability, careful attention is paid to survey design, ensuring clarity and unambiguous survey items, refined questions, absence of errors or biases, and implemented validation checks to detect careless responding. Furthermore, standardized procedures for survey administration and response validation checks are implemented to minimize researcher errors and biases.

Data cleaning procedures and robust statistical analyses further fortify reliability by identifying and addressing inconsistencies. By diligently addressing reliability concerns, the study ensures the integrity and validity of its findings, contributing to a deeper understanding of factors influencing global virtual teams' (GVTs) performance variability.

Moreover, Cronbach's alpha analysis is conducted on Likert scale questionnaire responses for the variables of Team Learning Behaviors, Emotional Intelligence, Trust, Team Creativity, and Collaborative Culture, with the results presented below.

Table 6. Cronbach's Alpha Analysis

Variable	Team Learning Behaviors	Emotional Intelligence	Trust	Team Creativity	Collaborative Culture
Cronbach's Alpha	0.812	0.915	0.865	0.950	0.899

Team Learning Behaviors ($\alpha = 0.812$): The alpha value signifies a high level of internal consistency among the items assessing both internal and external team learning behaviors. It suggests that variables such as knowledge sharing, seeking feedback, discussing errors, embracing innovation, and seeking external expertise to address challenges are interconnected. Team members consistently respond to both internal and external items concerning team learning behaviors, indicating a unified understanding of these behaviors among them.

Emotional Intelligence ($\alpha = 0.915$): The alpha statistic for internal consistency is exceptionally high among the items - awareness of own emotions, management of own emotions, awareness of others' emotions, and management of others' emotions - gauging emotional intelligence. This indicates a strong linkage among the four variables and suggests that the items actually capture different aspects of this construct and are rational in their measurement.

Trust ($\alpha = 0.865$): The alpha value indicates a high level of internal consistency among both affective and cognitive trust items pertaining to trust. It implies that these items, assessing trust from both emotional and rational perspectives, exhibit a satisfactory degree of coherence. Consequently, it suggests a harmonized perception of trust among team members, with the affective and cognitive trust items effectively capturing the construct of trust within the team.

Team Creativity ($\alpha = 0.950$): The alpha value expresses a remarkably high level of internal consistency among the items used to determine team creativity. This implies a strong consistency in measuring creativity within the team, indicative of a strong consensus among team members concerning the creative processes, generation of novel ideas, innovative solutions, and subsequent outcomes within the team.

Collaborative Culture ($\alpha = 0.899$): The alpha value indicates a strong internal consistency among the items evaluating collaborative culture. It suggests a close relationship among elements such as considering change, mutual appreciation, fostering diverse viewpoints, respecting team contributions, and opinions. This alignment in measurement underscores a shared understanding among team members regarding the norms and practices of collaboration within their team.

The true value of research resides in its capacity to establish specific generalizations (Kothari 2004, 19). Shadish (1995) contended that the fundamental principles of generalization are applicable to both quantitative and qualitative research (Miyata & Kai 2009, 71). Generalizability pertains to the degree to which the results of a research study can be applied to different contexts or settings (Saunders et al. 2009, 382). Generalizability, as defined by Rothman and Greenland (1998), refers to the degree to which findings derived from a specific sample can be extrapolated to the target population (Miyata and Kai 2009, 71). Miyata and Kai (2009, 71) mentioned that acknowledging the potential transferability of certain study findings to other contexts, exploration of generalization becomes beneficial.

Ensuring the broader applicability of the findings, generalizability is prioritized in this study. It's paramount in the study "Quantifying Global Virtual Teams' (GVTs) Performance Variability" as it determines the applicability of the research outcomes beyond the specific sampled teams and conditions. Generalizability pertains to the extent to which the insights gleaned from the study can be extended to other global virtual teams' (GVTs) beyond the specific sample and conditions examined.

To achieve this, the sample composition selected is diverse and representative of the broader population of interest, encompassing teams ensuring and representing participant profiles as aforementioned in section 3.2 Population and Samples. Employing statistical techniques, the unique relationships between team learning behaviors, emotional intelligence, trust, team creativity, collaborative culture, and global virtual teams' (GVTs) performance are analyzed. In the discussion of results, the emphasis is on the implications beyond the confines of the specific sample, considering diverse businesses, cultural contexts, and organizational structures. By adhering to these strategies, the study enhances its potential to contribute valuable insights into the

performance variability of global virtual teams' (GVTs), transcending geographical and cultural boundaries.

The analysis incorporates data from Survey 4 spanning four years (2020 to 2023), comprising 440 individuals. Despite a consistent response rate of nearly 90-95%, it is technically considered a sample rather than a census, as it does not encompass every individual from the larger population. This distinction is crucial, given the uncertainties surrounding the broader population's size and the shared characteristics among teams, which necessitates a sampling approach for evaluation.

This raises significant considerations regarding the representativeness of the sample. Utilizing this four-year dataset from Survey 4, the study conducts Cronbach's Alpha analysis to assess the internal consistency of survey items pertaining to team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture.

Contemplating whether this data constitutes a sample, or a census underscores the importance of scrutinizing the study's scope and limitations. While the high response rate implies a comprehensive dataset, it is imperative to recognize the potential biases and limitations inherent in sampling, even when employing what appears to be an exhaustive approach. Such nuanced understanding must be considered in interpreting findings and assessing their generalizability.

The next section, Section 4 "Findings", includes the details of the basic statistical characteristics of the data, the application of simple linear regression to test hypotheses, an evaluation of each hypothesis in light of the research findings, and the interpretation of results. Additionally, it provides insights into how these findings contribute to the existing literature of global virtual teams' (GVTs) performance.

4 Data Analysis and Findings

In this section, the study's data undergoes rigorous analysis to uncover insights and trends. Through descriptive statistics, regression analysis, hypothesis testing, and a discussion of findings, a comprehensive understanding of the research outcomes emerges.

In "4.1 Sample Data", comprehensive details of the dataset are provided, including data from each survey year, participant counts, team counts, and the preparation process. This careful approach establishes a strong ground for subsequent statistical analyses, ensuring accuracy and reliability in the study's outcomes.

Sub-section 4.2 "Descriptive Statistics" presents a thorough overview of the basic statistical traits of the data, including central tendency, measures of variation, and measures of shape. Insights into the distribution and variability of the dataset are provided, aiding a deeper understanding of its underlying patterns.

Sub-section 4.3, "Hypothesis Testing", focuses on utilizing simple linear regression for hypothesis testing and examining variable relationships, interpreting regression coefficients and significance levels to understand associations. Hypotheses are rigorously evaluated against statistical outcomes, considering correlations, p-values, and explanatory power within the study's framework.

The last sub-section, 4.4, "Discussion of Findings", interprets the results in the context of existing literature, drawing connections to theoretical frameworks and empirical studies. This comprehensive analysis ensures a thorough understanding of the research outcomes and their broader significance.

4.1 Sample Data

Sample data has been collected from a population comprising students from five international universities. The university's students are spread across various geographical locations and are engaged in a series of consulting projects conducted virtually.

During the data preparation phase, the dataset undergoes familiarizing, structuring, cleaning, and verifying to ensure its suitability for analysis. This process involves addressing missing values, junk values, formatting issues, and other data

irregularities, thereby enhancing the integrity and reliability of the dataset and laying a solid foundation for subsequent statistical analyses. Additionally, responses from survey questionnaires are reverse coded as part of the data preparation process to mitigate response bias in survey questionnaires utilizing Likert scales.

The accurate, complete, and structured sample data for variables such as team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture is then compiled for data analysis. The dataset holds data gathered from surveys conducted in the four years 2020, 2021, 2022, and 2023.

Across four years, the participant count is as follows: 133 in 2020, 120 in 2021, 84 in 2022, and 103 in 2023, totaling 440 participants. These participants are organized into 96 teams. To derive insights into the performance variability of global virtual teams' (GVTs), team-level observations have been computed. These observations represent the mean values derived from individual data points within each team.

This approach allows for the aggregation and summarization of team performance, facilitating a comprehensive analysis, rather than examining each individual observation in isolation. The table below provides a detailed breakdown of the sample data used for the analysis.

Table 7. Sample Data Overview

Survey Year	Survey 4 Participant Count	Survey 4 Team Count
2020	133	30
2021	120	26
2022	84	18
2023	103	22
Total	440	96

The next section, 4.2 “Descriptive Statistics”, provides statistics encompassing measures of central tendency, variation, and distribution. Each measure is explained in relation to individual variables and the performance of global virtual teams' (GVTs).

4.2 Descriptive Statistics

The descriptive statistics, which cover measures of central tendency, variation, and distribution, offer a complete summary of a dataset's properties. Below is a rundown of these statistics for the variables: team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture.

All calculations related to descriptive analysis were performed using IBM SPSS Statistics. This thorough analysis establishes the fundamental characteristics of the dataset, providing a basis for further analytical endeavors.

4.2.1 Measures of Central Tendency

These statistics indicate the central or typical value around which the data tend to cluster.

Table 8. Measure of Central Tendency

Statistics	Mean	Median	Mode
Team Learning Behaviors	4.46	4.50	4.62
Emotional Intelligence	3.44	3.40	3.38
Trust	3.69	3.70	2.71
Team Creativity	3.81	3.84	3.40
Collaborative Culture	3.96	4.00	4.15

Note: Numbers are rounded to 2 decimals.

Beginning with the measure of central tendency, the mean, median, and mode for each variable provide a comprehensive view of their typical values within the dataset. The mean serves as the average value of the data points, providing a measure of central tendency guided by the magnitude of each observation (Kumar 2017, 36).

The median, on the other hand, represents the middle value when the dataset is arranged in ascending or descending order, offering a strong measure less sensitive to extreme values. Lastly, the mode signifies the most frequently occurring value, indicating the prevalent response among the surveyed teams. (Kumar 2017, 37-38)

Team learning behaviors reveal a mean, median, and mode of 4.46, 4.50, and 4.62, respectively, indicating a symmetric distribution of data around this central tendency. This suggests a generally high level of team learning behaviors among the surveyed

teams, with a slight skew towards higher values (a slight right skew). This is evident as the mode is slightly greater than the mean and median, and the mean value is also above the midpoint of the scale.

Emotional intelligence shows a mean, median, and mode of 3.44, 3.40, and 3.38, respectively, which are comparable. These figures conclude a moderate level of emotional intelligence within the teams, with some teams scoring lower than others. The distribution appears reasonably symmetrical around the median, as evidenced by the mode being close to both the mean and median.

Trust is illustrated by a mean, median, and mode of 3.69, 3.70, and 2.71, respectively. The closeness of the mean and median, linked with the significant difference in mode, suggests a non-symmetric distribution, indicative of a moderate to high level of trust within the teams. However, the mode notably lower than both the mean and median suggests the presence of a subgroup with significantly lower trust scores, possibly indicating outlier values pulling the distribution towards lower trust levels, i.e. skewed towards lower trust levels. Consequently, some teams report lower levels of trust compared to others.

Team creativity demonstrates a mean, median, and mode of 3.81, 3.84, and 3.40, respectively. These values are relatively close, indicating a symmetric distribution. The statistics suggest a generally high level of team creativity. However, there's a slight skew towards lower values, evident from the mode being less than both the mean and median. Additionally, the mean being slightly above the midpoint of the scale further reinforces this observation.

Finally, collaborative culture is characterized by a mean, median, and mode of 3.96, 4.00, and 4.15, respectively, which are comparable. A mean of 3.96 indicates a moderately strong emphasis on collaboration within teams. The median and mode being slightly higher than the mean suggest a right-skewed distribution, indicating that a significant portion of teams exhibit higher-than-average levels of collaborative culture.

Inferences drawn from these descriptive statistics reveal valuable insights into the characteristics of the surveyed teams. Teams generally demonstrate high levels of learning behaviors, creativity, and collaborative culture, as indicated by means above the midpoints of the respective scales.

Emotional intelligence levels vary among teams, with some revealing higher levels than others. Trust levels vary considerably among teams, with some reporting considerably lower levels compared to others, possibly impacting team dynamics and performance.

4.2.2 Measures of Variation

These statistics quantify the spread or variability or dispersion of the data points around the central tendency.

Table 9. Measure of Variation

Statistics	Range	Variance	S.D.
Team Learning Behaviors	2.26	0.26	0.51
Emotional Intelligence	2.05	0.16	0.40
Trust	2.37	0.30	0.55
Team Creativity	2.66	0.24	0.49
Collaborative Culture	2.15	0.19	0.44

Note: Numbers are rounded to 2 decimals.

The dataset's features are analyzed through measures of variation that offer valuable insights into the dispersion and consistency of the variables under consideration, namely team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture. Employing descriptive statistics such as range, variance, and standard deviation facilitates a complete understanding of the variability essential within these variables. The range, which suggests the difference between the maximum and minimum values in the dataset, provides a straightforward indication of the spread of values across each variable (Kumar 2017, 40).

Meanwhile, the variance presents a measure of the average squared differences from the mean, providing a refined understanding of the dispersion around the central tendency. The standard deviation, being the square root of the variance, presents a metric of the average distance of data points from the mean, therefore explaining the extent of variability in relation to the mean value. (Kumar 2017, 40-41)

Commencing with team learning behaviors, the range spans 2.26, denoting a considerable spread of scores within this dimension across the teams. Moreover, the

variance and standard deviation values of 0.26 and 0.51, respectively, suggest a moderate level of dispersion around the mean score. That is, teams' learning behaviors tend to cluster closely around the mean value. This variability implies diverse levels of engagement and approaches toward learning behaviors among the teams.

Emotional intelligence exhibits a narrower range of 2.05, indicating a comparatively lesser spread of scores in this domain. Furthermore, the variance and standard deviation values of 0.16 and 0.40, respectively, highlight a relatively lower degree of variability around the mean. In other words, emotional intelligence scores tend to be closely clustered around the mean value. This suggests a more uniform distribution of emotional intelligence scores across the teams, albeit with some level of divergence.

Trust, a crucial component of team dynamics, demonstrates a wider range of 2.37, indicating a notable disparity in trust levels among the teams. The variance and standard deviation values of 0.30 and 0.55, respectively, verify this observation, revealing a meaningful degree of variability around the mean trust score. This variability underscores the varied nature of trust dynamics within the teams; in other words, trust levels vary considerably among teams.

Team creativity, essential for innovation and problem-solving, showcases a range of 2.66, signifying a considerable spectrum of creativity scores across the teams. Similarly, the variance and standard deviation values of 0.24 and 0.49, respectively, highlight a moderate level of variability around the mean creativity score. This variability suggests diverse levels of creative aptitude and approaches within the teams.

Finally, collaborative culture, indicative of cooperative interactions and shared objectives, exhibits a range of 2.15, denoting varying degrees of collaboration among the teams. The variance and standard deviation values of 0.19 and 0.44, respectively, suggest a moderate level of dispersion around the mean collaborative culture score. This variability underscores differing levels of emphasis on collaboration and teamwork within the teams.

Inferences drawn from these measures of variation underscore the diverse nature of team dynamics, with varying levels of variability observed across the dimensions of learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture. Trust exhibits the highest variability among the variables, indicating pronounced

differences in trust levels across teams. Emotional intelligence, team creativity, and collaborative culture demonstrate moderate variability, suggesting substantial differences among teams but to a lesser extent than trust. Team learning behaviors exhibit the lowest variability among the variables, indicating relatively consistent learning approaches across teams.

4.2.3 Measures of Distribution

These statistics describe how the data are spread out across different values.

Table 10. Measure of Distribution

Statistics	Skewness	Kurtosis
Team Learning Behaviors	-0.27	0.20
Emotional Intelligence	0.33	0.03
Trust	-0.08	-0.56
Team Creativity	-0.34	0.43
Collaborative Culture	-0.43	-0.02

Note: Numbers are rounded to 2 decimals.

The dataset's features are analyzed through measures of distribution, specifically skewness and kurtosis, provides valuable insights into the shape and nature of the distributions for the variables of interest: team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture.

Skewness measures asymmetry around the mean, while kurtosis measures the peakedness or flatness relative to a normal distribution. Negative skewness values advocate a leftward skew, indicating a concentration of lower values, whereas positive values indicate a rightward skew, implying a concentration of higher values. (Kumar 2017, 43-45) A kurtosis less than 3 indicates a platykurtic distribution, while a kurtosis greater than 3 indicates a leptokurtic distribution. A kurtosis of 3 denotes a standard normal distribution, also known as mesokurtic. (Kumar 2017, 43-45)

Beginning with team learning behaviors, the negative skewness of -0.27 suggests a slight leftward skew, indicating a tendency towards lower scores compared to the mean. However, the kurtosis of 0.20 indicates a relatively normal distribution, suggesting that while there may be some deviation from the mean towards lower scores, the distribution

is generally neither heavily peaked nor excessively flat. This implies that team learning behaviors is fairly evenly distributed around the mean, with a slight inclination towards lower scores, i.e., the majority of teams exhibit relatively high levels of learning behaviors.

For emotional intelligence, the positive skewness of 0.33 indicates a slight rightward skew, suggesting a tendency towards higher scores compared to the mean. The kurtosis of 0.03 suggests a distribution that closely resembles a normal distribution, with neither an asserted peak nor excessive flatness. This indicates that emotional intelligence scores are distributed relatively evenly around the mean, with a slight inclination towards higher scores, i.e., teams exhibiting elevated levels of emotional intelligence.

Trust demonstrates a slight negative skewness of -0.08, suggesting a minor leftward skew, indicating a slight tendency for more teams to report higher trust levels. The negative kurtosis of -0.56 indicates a distribution that is flatter than a normal distribution, suggesting a broader spread of scores. This implies that while trust scores may slightly favor lower values, there is a notable dispersion of scores across the dataset.

Team creativity exhibits a negative skewness of -0.34, indicating a slight leftward skew, suggesting a tendency towards lower scores compared to the mean. The positive kurtosis of 0.43 suggests a distribution that is moderately peaked, indicating a concentration of scores around the mean with some outliers. This implies that while team creativity scores may lean towards lower values, there is a moderate concentration of scores around the mean.

Lastly, collaborative culture displays a negative skewness of -0.43, suggesting a slight leftward skew, indicating a tendency towards lower scores compared to the mean. The negative kurtosis of -0.02 suggests a distribution that is flatter than a normal distribution, similar to the distribution of trust scores. This indicates a broader spread of collaborative culture scores across the dataset, with a slight inclination towards lower values.

Inferences drawn from these measures of distribution provide valuable insights into the shape and nature of the distributions for the variables under consideration. Team learning behaviors, trust, and collaborative culture exhibit relatively symmetrical distributions with slight left skewness, indicating a slight tendency for more teams to

report higher scores in these variables. Emotional intelligence and team creativity distributions show slight right skewness, suggesting a slight tendency for more teams to exhibit higher scores in these variables. Overall, the variables demonstrate varying degrees of peakedness, or flatness compared to a normal distribution, with most showing moderate concentration around their respective means.

Sub-section 4.3, titled “Hypothesis Testing”, explores the application of simple linear regression for two primary objectives: hypothesis testing and the analysis of variable relationships. Each hypothesis undergoes rigorous scrutiny against the statistical outcomes to determine its validity and relevance. These statistics provide valuable insights into the strength and significance of the relationships observed, thereby facilitating a comprehensive evaluation of the hypotheses.

4.3 Hypothesis Testing

In this section, each hypothesis formulated for the study is systematically and thoroughly examined and assessed in light of the empirical findings obtained from the regression analysis of the sample data. This process involves interpretation of statistical outputs, enabling a systematic comparison between the observed empirical evidence and the theoretical constructs proposed in the hypotheses. This process facilitates the evaluation of the hypotheses’ validity within the context of quantifying performance variability in global virtual teams’ (GVTs).

Regression analysis, utilized to quantify the performance variability of global virtual teams’ (GVTs), employs Simple Linear Regression. The regression analysis focuses on the relationship between team performance, treated as the dependent variable, and several independent variables including team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture.

Each independent variable is assessed individually in relation to team performance to determine the association between the dependent variable and each independent variable. This analytical approach provides essential statistics crucial for evaluating the relationship and model adequacy.

These statistics are typically summarized through various outputs including model summary, analysis of variance, coefficients, and residuals statistics, offering insights into

the strength and significance of the relationship between variables and the overall performance of the regression model.

All calculations related to regression analysis were performed using IBM SPSS Statistics. In SPSS, the default setting for the confidence interval (Level %) of simple linear regression is typically 95%. This means that the confidence intervals for the regression coefficients, including the intercept and slope, are calculated at the 95% confidence level by default.

4.3.1 Team Learning Behaviors

***Hypothesis H1:** Team learning behavior is positively associated with global virtual teams' (GVTs) performance.*

Dependent Variable (Y): Global Virtual Teams' (GVTs) Performance

Independent Variable (X): Team Learning Behaviors

Table 11. Team Learning Behaviors

Regression Analysis			
Model Summary			
R	R Square	Adjusted R Square	Standard Error of Estimate
0.275	0.076	0.066	10.039

Interpretation: The Pearson correlation coefficient (R) between team learning behaviors and global virtual team performance is 0.275. This indicates a positive but weak linear relationship between these variables. It suggests that as team learning behaviors increase, team performance tends to increase, albeit modestly.

The model's R squared value, which measures the proportion of variance in the global virtual teams' (GVTs) performance explained by the independent variable team learning behaviors, is 0.076.

This indicates that approx. 7.6% of the variance in team performance can be reported for by team learning behaviors. Though it implies that team learning behaviors explain a relatively small portion of the variation in team performance, it still indicates a significant relationship.

The adjusted R square implies that when considering the number of explanatory variables in the model, the variance explained drops slightly to 6.6%. The standard error of the estimate is 10.039, indicating the average distance between the observed values and the predicted values by the model.

Analysis of Variance (ANOVA)					
Statistics	Sum of Square	Degree of Freedom	Mean Square	F	Sig.
Regression	775.852	1	775.852	7.698	0.007
Residual	9473.482	94	100.782		
Total	10249.333	95			

Interpretation: The ANOVA table implies that the regression model is statistically significant, as supported by an F-statistic of 7.698 and a p-value of 0.007. This suggests that the regression model with team learning behaviors as the explanatory variable significantly quantify global virtual teams' (GVT) performance.

Coefficients					
Statistics	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	Beta	Std. Error	Beta		
Constant	52.939	9.061		5.843	< 0.001
Team Learning Behaviors	5.600	2.018	0.275	2.775	0.007
GVTs' Performance = 52.939 + 5.600 x Team Learning Behaviors					

Interpretation: The constant, representing the intercept, is 52.939 with a standard error of 9.061. This suggests that when team learning behaviors is zero, the predicted team performance is approximately 52.939.

The coefficient for Team Learning Behaviors is 5.600, with a standard error of 2.018. This suggests that for every one-unit increase in team learning behaviors, global virtual teams' (GVT) performance is expected to increase by 5.600 units.

The t-value of 2.775 indicates that this coefficient is statistically significant ($p = 0.007$), providing further evidence that team learning behaviors have a significant positive effect on global virtual teams' (GVT) performance.

Residual Statistics					
Statistics	Minimum	Maximum	Mean	S.D.	N
Predicted Value	70.27	84.97	77.92	2.858	96
Residual	-30.614	24.395	0.000	9.986	96
Std. Predicted Value	-2.675	2.467	0.000	1.000	96
Std. Residual	-3.050	2.430	0.000	0.995	96

Interpretation: The residual statistics show that the predicted values of Team Performance range from 70.27 to 84.97, with a mean of 77.92 and a standard deviation of 2.858. The residuals have a mean of 0 and a standard deviation of 9.986.

The standard deviation of the residuals (9.986) gives an indication of the spread of the residuals around the regression line. Standardized residuals are approximately normally distributed with a mean of 0 and a standard deviation close to 1.

4.3.2 Emotional Intelligence

Hypothesis H2: *Team emotional intelligence is positively associated with global virtual teams' (GVTs) performance.*

Dependent Variable (Y): Team Performance

Independent Variable (X): Emotional Intelligence

Table 12. Emotional Intelligence

Regression Analysis			
Model Summary			
R	R Square	Adjusted R Square	Standard Error of Estimate
0.291	0.085	0.075	9.990

Interpretation: The Pearson correlation coefficient (R) between Emotional Intelligence and Team Performance is 0.291. This indicates a positive but still moderate

linear relationship between these variables. It suggests that as Emotional Intelligence increases, Team Performance tends to increase as well, though the relationship is not exceptionally strong.

The model's R squared value, which measures the proportion of variance in the dependent variable (global virtual teams' (GVTs) performance) explained by the independent variable (Emotional Intelligence), is 0.085.

This indicates that approximately 8.5% of the variance in team performance can be accounted for by Emotional Intelligence. Although emotional intelligence explains only a small part of the difference in team performance, it still indicates a meaningful relationship.

The adjusted R square, which considers the number of predictors in the model, drops slightly to 7.5%. The standard error of the estimate is 9.990, suggesting the average distance between the observed values and the predicted values by the model.

Analysis of Variance (ANOVA)					
Statistics	Sum of Square	Degree of Freedom	Mean Square	F	Sig.
Regression	867.670	1	867.670	8.694	0.004
Residual	9381.663	94	99.805		
Total	10249.333	95			

Interpretation: The ANOVA table shows that the regression model is statistically significant, with an F-statistic of 8.694 and a p-value of 0.004. This indicates that the regression model with Emotional Intelligence as the predictor variable significantly predicts Team Performance.

Coefficients					
Statistics	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	Beta	Std. Error	Beta		
Constant	52.315	8.743		5.984	< 0.001

Emotional Intelligence	7.438	2.523	0.291	2.949	0.004
GVTs' Performance = 52.315 + 7.438 x Emotional Intelligence					

Interpretation: The constant representing the intercept is 52.315 with a standard error of 8.743. This suggests that when emotional intelligence is zero, the predicted team performance is approximately 52.315.

The coefficient for Emotional Intelligence is 7.438, with a standard error of 2.523. This suggests that for every one-unit increase in Emotional Intelligence, Team Performance is expected to increase by 7.438 units.

The t-value of 2.949 indicates that this coefficient is statistically significant ($p = 0.004$), further supporting the notion that Emotional Intelligence positively influences Team Performance.

Residual Statistics					
Statistics	Minimum	Maximum	Mean	S.D.	N
Predicted Value	71.47	86.72	77.92	3.022	96
Residual	-29.722	23.152	0.000	9.938	96
Std. Predicted Value	-2.134	2.912	0.000	1.000	96
Std. Residual	-2.975	2.317	0.000	0.995	96

Interpretation: The residual statistics show that the predicted values of Team Performance range from 71.47 to 86.72, with a mean of 77.92 and a standard deviation of 3.022. The residuals have a mean of 0 and a standard deviation of 9.938.

The standard deviation of the residuals (9.938) gives an indication of the spread of the residuals around the regression line. Standardized residuals are approximately normally distributed with a mean of 0 and a standard deviation close to 1.

4.3.3 Trust

Hypothesis H3: *Trust is positively associated with global virtual teams' (GVTs) performance.*

Dependent Variable (Y): Team Performance

Independent Variable (X): Trust

Table 13. Trust

Regression Analysis			
Model Summary			
R	R Square	Adjusted R Square	Standard Error of Estimate
0.273	0.075	0.065	10.044

Interpretation: The Pearson correlation coefficient (R) between Trust and Team Performance is 0.273. This indicates a positive but still relatively weak linear relationship between these variables. It suggests that as Trust increases, Team Performance tends to increase as well, though the relationship is not very strong.

The model's R squared value, which measures the proportion of variance in the dependent variable (global virtual teams' (GVTs) performance) explained by the independent variable (Trust), is 0.075.

This indicates that approximately 7.5% of the variance in team performance can be accounted for by Trust. While this suggests that trust accounts for a relatively small proportion of the variance in team performance, it still signifies a meaningful relationship.

The adjusted R square, considering the number of predictors in the model, drops slightly to 6.5%. The standard error of the estimate is 10.044, suggesting the average distance between the observed values and the predicted values by the model.

Analysis of Variance (ANOVA)					
Statistics	Sum of Square	Degree of Freedom	Mean Square	F	Sig.
Regression	765.634	1	765.634	7.589	0.007
Residual	9483.699	94	100.890		
Total	10249.333	95			

Interpretation: The ANOVA table shows that the regression model is statistically significant, with an F-statistic of 7.589 and a p-value of 0.007. This suggests that the regression model with Trust as the predictor variable significantly predicts Team Performance.

Coefficients					
Statistics	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	Beta	Std. Error	Beta		
Constant	58.858	6.994		8.415	< 0.001
Trust	5.154	1.871	0.273	2.755	0.007
GVTs' Performance = 58.858 + 5.154 x Trust					

Interpretation: The constant, representing the intercept, is 58.858 with a standard error of 6.994. This suggests that when trust is zero, the predicted team performance is approximately 58.858.

The coefficient for Trust is 5.154, with a standard error of 1.871. This suggests that for every one-unit increase in Trust, Team Performance is expected to increase by 5.154 units.

The t-value of 2.755 indicates that this coefficient is statistically significant ($p = 0.007$), providing further evidence that Trust positively influences Team Performance.

Residual Statistics					
Statistics	Minimum	Maximum	Mean	S.D.	N
Predicted Value	72.43	84.63	77.92	2.839	96
Residual	-29.897	23.109	0.000	9.991	96
Std. Predicted Value	-1.931	2.364	0.000	1.000	96
Std. Residual	-2.977	2.301	0.000	0.995	96

Interpretation: The residual statistics show that the predicted values of Team Performance range from 72.43 to 84.63, with a mean of 77.92 and a standard deviation of 2.839. The residuals have a mean of 0 and a standard deviation of 9.991.

The standard deviation of the residuals (9.991) gives an indication of the spread of the residuals around the regression line. Standardized residuals are approximately normally distributed with a mean of 0 and a standard deviation close to 1.

4.3.4 Team Creativity

Hypothesis H4: *Team creativity is positively associated with global virtual teams' (GVTs) performance.*

Dependent Variable (Y): Team Performance

Independent Variable (X): Team Creativity

Table 14. Team Creativity

Regression Analysis			
Model Summary			
R	R Square	Adjusted R Square	Standard Error of Estimate
0.293	0.086	0.076	9.984

Interpretation: The Pearson correlation coefficient (R) between Team Creativity and Team Performance is 0.293. This indicates a positive and moderately strong linear relationship between these variables. It suggests that as Team Creativity increases, Team Performance tends to increase as well, with a relatively higher correlation compared to previous hypotheses.

The model's R squared value, which measures the proportion of variance in the dependent variable (global virtual teams' (GVTs) performance) explained by the independent variable (Team Creativity), is 0.086.

This indicates that approximately 8.6% of the variance in team performance can be accounted for by Team Creativity. Even though it's a small percentage, it indicates an important connection between team creativity and team performance.

The adjusted R square, considering the number of predictors in the model, is 7.6%. The standard error of the estimate is 9.984, suggesting the average distance between the observed values and the predicted values by the model.

Analysis of Variance (ANOVA)					
Statistics	Sum of Square	Degree of Freedom	Mean Square	F	Sig.
Regression	880.031	1	880.031	8.829	0.004
Residual	9369.302	94	99.673		
Total	10249.333	95			

Interpretation: The ANOVA table shows that the regression model is statistically significant, with an F-statistic of 8.829 and a p-value of 0.004. This suggests that the regression model with Team Creativity as the predictor variable significantly predicts Team Performance.

Coefficients					
Statistics	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	Beta	Std. Error	Beta		
Constant	54.645	7.898		6.919	< 0.001
Team Creativity	6.099	2.053	0.293	2.971	0.004
GVTs' Performance = 54.645 + 6.099 x Team Creativity					

Interpretation: The constant, representing the intercept, is 54.645 with a standard error of 7.898. This suggests that when team creativity is zero, the predicted team performance is approximately 54.645.

The coefficient for Team Creativity is 6.099, with a standard error of 2.053. This suggests that for every one-unit increase in Team Creativity, Team Performance is expected to increase by 6.099 units.

The t-value of 2.971 indicates that this coefficient is statistically significant ($p = 0.004$), providing strong evidence that Team Creativity positively influences Team Performance.

Residual Statistics					
Statistics	Minimum	Maximum	Mean	S.D.	N
Predicted Value	68.95	85.14	77.92	3.044	96
Residual	-30.327	23.229	0.000	9.931	96
Std. Predicted Value	-2.947	2.374	0.000	1.000	96
Std. Residual	-3.038	2.327	0.000	0.995	96

Interpretation: The residual statistics show that the predicted values of Team Performance range from 68.95 to 85.14, with a mean of 77.92 and a standard deviation of 3.044. The residuals have a mean of 0 and a standard deviation of 9.931.

The standard deviation of the residuals (9.931) gives an indication of the spread of the residuals around the regression line. Standardized residuals are approximately normally distributed with a mean of 0 and a standard deviation close to 1.

4.3.5 Collaborative Culture

Hypothesis H5: *Collaborative culture is positively associated with global virtual teams' (GVTs) performance.*

Dependent Variable (Y): Team Performance

Independent Variable (X): Collaborative Culture

Table 15. Collaborative Culture

Regression Analysis			
Model Summary			
R	R Square	Adjusted R Square	Standard Error of Estimate
0.256	0.065	0.055	10.095

Interpretation: The Pearson correlation coefficient (R) between Collaborative Culture and Team Performance is 0.256. This indicates a positive but relatively weak

linear relationship between these variables. It suggests that as Collaborative Culture increases, Team Performance tends to increase as well, though the relationship is not very strong.

The model's R squared value, which measures the proportion of variance in the dependent variable (global virtual teams' (GVTs) performance) explained by the independent variable (Collaborative Culture), is 0.065.

This indicates that approximately 6.5% of the variance in team performance can be accounted for by Collaborative Culture. Though it's relatively small, it still signifies a meaningful relationship between collaborative culture and team performance.

The adjusted R square, considering the number of predictors in the model, is 5.5%. The standard error of the estimate is 10.095, suggesting the average distance between the observed values and the predicted values by the model.

Analysis of Variance (ANOVA)					
Statistics	Sum of Square	Degree of Freedom	Mean Square	F	Sig.
Regression	670.261	1	670.261	6.577	0.012
Residual	9579.072	94	101.905		
Total	10249.333	95			

Interpretation: The ANOVA table shows that the regression model is statistically significant, with an F-statistic of 6.577 and a p-value of 0.012. This suggests that the regression model with Collaborative Culture as the predictor variable significantly predicts Team Performance.

Coefficients					
Statistics	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	Beta	Std. Error	Beta		
Constant	54.060	9.359		5.776	< 0.001

Collaborative Culture	6.015	2.345	0.256	2.565	0.012
GVTs' Performance = 54.060 + 6.015 x Collaborative Culture					

Interpretation: The constant, representing the intercept, is 54.060 with a standard error of 9.359. This suggests that when trust is zero, the predicted team performance is approximately 54.060.

The coefficient for Collaborative Culture is 6.015, with a standard error of 2.345. This suggests that for every one-unit increase in Collaborative Culture, Team Performance is expected to increase by 6.015 units.

The t-value of 2.565 indicates that this coefficient is statistically significant ($p = 0.012$), providing evidence that Collaborative Culture positively influences Team Performance.

Residual Statistics					
Statistics	Minimum	Maximum	Mean	S.D.	N
Predicted Value	71.19	84.14	77.92	2.656	96
Residual	-28.865	23.173	0.000	10.042	96
Std. Predicted Value	-2.533	2.341	0.000	1.000	96
Std. Residual	-2.859	2.296	0.000	0.995	96

Interpretation: The residual statistics show that the predicted values of Team Performance range from 71.19 to 84.14, with a mean of 77.92 and a standard deviation of 2.656. The residuals have a mean of 0 and a standard deviation of 10.042.

The standard deviation of the residuals (10.042) gives an indication of the spread of the residuals around the regression line. Standardized residuals are approximately normally distributed with a mean of 0 and a standard deviation close to 1.

In the final sub-section, 4.4, titled “Discussion of Findings”, the results are interpreted within the context of established literature. This involves linking the findings to theoretical frameworks and empirical studies, facilitating a comprehensive analysis. Through this process, a deeper understanding of the research outcomes and their broader implications is achieved.

4.4 Discussion of Findings

The central aim is to present a thorough discussion of the findings and conclusions pertaining to each hypothesis. This commences with a concise overview of the results associated with the hypotheses, bringing out the pivotal outcomes and discoveries gleaned from the investigation. Subsequently, the discussion delves into an analysis of the alignment or disparity of these findings with prior research endeavors within the field.

This table provides a comprehensive summary of the hypothesis results, including p-values, Pearson correlations (R), R-Squared values, and the status of each hypothesis based on the results.

Hypothesis Results Status				
Hypothesis	p-value	Correlation (R)	R-Square	Hypothesis Status
H1	0.007	0.275	0.076	True: Supported by the Data
H2	0.004	0.291	0.085	True: Supported by the Data
H3	0.007	0.273	0.075	True: Supported by the Data
H4	0.004	0.293	0.086	True: Supported by the Data
H5	0.012	0.256	0.065	True: Supported by the Data

4.4.1 Hypothesis 1

Hypothesis H1: Team learning behavior is positively associated with global virtual teams' (GVTs) performance.

The findings suggest that there is a statistically significant positive association between team learning behaviors and the performance of global virtual teams' (GVTs), aligning with the results of Edmondson's (1999, 365-366) hypothesis that learning behavior is a significant predictor of team performance. Although the relationship is weak (Pearson correlation of 0.275), it is still meaningful, as evidenced by the significant coefficients and ANOVA results.

Team learning behaviors appear to contribute to approximately 7.6% of the variability in team performance, indicating that other factors not included in this analysis also play a role. However, given the increasing prevalence of global virtual teams'

(GVTs) in today's interconnected world, nurturing and promoting effective team learning behaviors could lead to tangible improvements in performance.

Therefore, organizations seeking to enhance the performance of their global virtual teams' (GVTs) should prioritize initiatives aimed at fostering a culture of seeking feedback, assistance, and information, experimenting and reflection on results, discussing errors or unexpected outcomes of actions, among team members and feedback from customers or other parts of the organization as suggested by Edmondson (1999, 351-363) as well.

Team learning behaviors, while not entirely explanatory of the performance differences observed among global virtual teams' (GVTs), offer a significant opportunity for intervention and enhancement. Team learning behaviors represent a valuable area for improvement, with the potential to yield considerable benefits in terms of team performance and overall organizational success. Further exploration into additional factors influencing global virtual teams' (GVTs) performance and the long-term effects of interventions targeting team learning behaviors is warranted.

4.4.2 Hypothesis 2

Hypothesis H2: *Team emotional intelligence is positively associated with global virtual teams' (GVTs) performance.*

The analysis reveals a statistically significant positive association between emotional intelligence and the performance of global virtual teams' (GVTs), thus supporting Hypothesis H2. Jordan and Lawrence's (2009, 452) research findings, which assert that emotional intelligence is a crucial factor in quantifying team performance, are consistent with the findings of Hypothesis 2. This indicates that the claim is supported by the collected data concerning global virtual teams' (GVTs). The moderate correlation coefficient (0.291) suggests that emotional intelligence plays a meaningful role in accounting for the variability in team performance within global virtual teams' (GVTs).

While emotional intelligence explains only around 8.5% of the variability in team performance, it is nonetheless a noteworthy factor. This suggests that although emotional intelligence is important, other variables not included in this analysis also influence global virtual teams' (GVTs) performance. Organizations seeking to enhance the performance

of their global virtual teams' (GVTs) should take into account the role of emotional intelligence in team dynamics.

Barczak et al. (2010, 332) assert that emotional intelligence has been widely acknowledged as a crucial factor contributing to team performance. Teams have the capacity to cultivate heightened emotional intelligence, thereby enhancing their collective performance. (Druskat & Wolff 2001)

Emotional Intelligence alone may not entirely account for the variability in global virtual teams' (GVTs) performance; however, it represents a significant contributor, suggesting the necessity for further research to explore additional factors impacting global virtual teams' (GVTs) performance and investigate the combined effects of Emotional Intelligence with other variables.

4.4.3 Hypothesis 3

Hypothesis H3: *Trust is positively associated with global virtual teams' (GVTs) performance.*

The analysis confirms Hypothesis H3, demonstrating a statistically significant positive association between trust and the performance of global virtual teams' (GVTs). This finding aligns with Rao's (2015, 7) assertion in "Hypothesis 1a" that trust positively influences the performance of global outsourcing teams. Additionally, Rao (2015, 13) concludes that fostering trust among team members is crucial for managing risks and uncertainties in the task environment, ultimately resulting in improved performance. While the correlation coefficient (0.273) suggests a relatively weak relationship, the results demonstrate that trust plays a meaningful role in quantifying global virtual teams' (GVTs) performance.

Although Trust explains only around 7.5% of the variability in team performance of global virtual teams', it is still a significant factor. This underscores the importance of fostering trust within global virtual teams' (GVTs) to enhance team performance and achieve team goals. Organizations seeking to improve the performance of their global virtual teams' (GVTs) should prioritize initiatives aimed at building and maintaining trust among team members.

Trust alone may not comprehensively account for the variance in global virtual teams' (GVTs) performance, yet it serves as a pivotal component in refining team dynamics and attaining success in virtual collaboration. Future research endeavors could delve into supplementary factors affecting trust within global virtual teams' (GVTs) and examine how trust interacts with other variables to influence team performance. Nevertheless, fostering trust within global virtual teams' (GVTs) emerges as a promising approach to augment overall team performance and advance organizational objectives.

4.4.4 Hypothesis 4

Hypothesis H4: *Team creativity is positively associated with global virtual teams' (GVTs) performance.*

The analysis provides support for Hypothesis H4, indicating a statistically significant positive association between team creativity and the performance of global virtual teams' (GVTs). The moderately strong correlation coefficient (0.293) suggests that team creativity plays a meaningful role in quantifying global virtual teams' (GVTs) performance.

The outcome of Hypothesis H4 aligns with Yoon et al.'s claim (2010, 257-258) that team creativity has a substantial impact on enhancing knowledge creation practices, which, in turn, contributes to perceived team performance using structural equation modelling (SEM). In simpler terms, team creativity significantly affects both collaborative knowledge creation practices within teams and perceived team performance (Yoon et al. 2010, 259).

While team creativity explains only around 8.6% of the variability in team performance in a global virtual setting, it remains a significant factor. This underscores the importance of fostering a creative environment within global virtual teams' (GVTs) to enhance team performance and achieve team goals. Organizations aiming to improve the performance of their global virtual teams' (GVTs) should prioritize initiatives aimed at encouraging and supporting team creativity.

Team Creativity may not fully account for the variability in global virtual teams' (GVTs) performance, it nonetheless represents a crucial element in fostering innovation and driving team success. Further research could explore additional factors influencing team creativity within global virtual teams' (GVTs) and investigate the combined effects

of creativity with other variables on team performance, suggesting that nurturing team creativity within global virtual teams' (GVTs) holds promise for enhancing overall team performance and achieving organizational objectives.

4.4.5 Hypothesis 5

Hypothesis H5: *Collaborative culture is positively associated with global virtual teams' (GVTs) performance.*

The analysis provides support for Hypothesis H5, indicating a statistically significant positive association between collaborative culture and global virtual teams' (GVTs) performance. Although the correlation coefficient (0.256) suggests a relatively weak relationship, the results demonstrate that collaborative culture plays a meaningful role in quantifying global virtual teams' (GVTs) performance.

Hypothesis H5 aligns with Zhang et al.'s (2011, 564) assertion that "Collaboration know-how will be positively related to team performance", defining collaboration know-how as individuals' capacity to effectively communicate and integrate ideas within distributed teams. Zhang et al. (2011, 564) utilized structural equation modelling (SEM) to empirically validate that collaboration know-how significantly enhances team performance, underscoring the pivotal role of effective team collaboration and knowledge integration in influencing overall team performance.

While collaborative culture explains only around 6.5% of the variability in global virtual teams' (GVTs) performance, it remains a significant factor. This highlights the importance of fostering a collaborative environment within global virtual teams' (GVTs) to enhance team performance and achieve team goals. Organizations seeking to improve the performance of their global virtual teams' (GVTs) should prioritize initiatives aimed at promoting collaboration and teamwork.

Collaborative culture is a key factor in boosting teamwork and enhancing team success within global virtual teams' (GVTs), although it might not fully account for their performance variability. Future studies could delve into other factors impacting collaborative culture in global virtual teams' (GVTs) and examine how collaboration interacts with other variables to influence team performance, suggesting that fostering a collaborative culture within global virtual teams' (GVTs) is a promising approach for meeting organizational goals.

5 Conclusion

The concluding remarks of this thesis capture the finale of an exhaustive investigation into the performance of global virtual teams' (GVTs), synthesizing key findings and implications. Through meticulous analysis, the study illuminates theoretical insights and practical strategies aimed at enhancing the performance of global virtual teams' (GVTs) within the context of an increasingly interconnected world.

In Section 5.1, the synthesis of key findings from the study and relevant literature contributes to a deeper understanding of the performance of global virtual teams' (GVTs). This section emphasizes the critical importance of bridging theoretical frameworks with empirical evidence to propel advancements in this field.

In Section 5.2, practical implications are elucidated as theoretical insights are translated into actionable recommendations for organizations and leaders seeking to optimize the performance of global virtual teams' (GVTs). By implementing these recommendations, organizations can enhance the performance of global virtual teams' (GVTs), thereby improving their competitiveness.

In Section 5.3, the outlining of future research directions addresses the limitations of the current study and introduces new avenues for inquiry. By identifying areas for further exploration, this section encourages scholars to continue refining their understanding of the performance of global virtual teams' (GVTs), thereby facilitating ongoing advancements in both theory and practice.

5.1 Theoretical Contributions

Global virtual teams' (GVTs) are earning recognition as technology surpasses geographical, time-related, and organizational constraints (Saunders et al. 2004, 19). As organizations increasingly depend on global virtual teams' (GVTs), gaining insight into the dynamics and performance of this organizational unit becomes increasingly vital. Researchers have contributed to the field by advancing a variety of theoretical explanations and models aimed at explaining global virtual teams' (GVTs) performance, with these models often incorporating various categories of predictors.

Building upon the growing recognition of global virtual teams' (GVTs) as indispensable components of modern organizations, research endeavors delve deeper into

understanding their dynamics and performance. This is exemplified by the thesis “Quantifying Global Virtual Teams’ (GVTs) Performance Variability”, which aims to contribute theoretical insights into the factors influencing global virtual teams’ (GVTs) performance. These contributions stem from the analysis of key variables such as team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture. By examining the relationships between these variables and global virtual teams’ (GVTs) performance, the research enhances the theoretical understanding of team dynamics in virtual settings.

In this research, the first variable explored is team learning behaviors, drawn from Amy Edmondson’s study (1999) on “Psychological Safety and Learning Behavior in Work Teams”. Edmondson examined four types of teams within a manufacturing company, all operating in a collocated environment. The results of Edmondson’s study show a positive association between team learning behaviors and team performance. This research extends Edmondson’s findings to explore the influence of team learning behaviors on global virtual teams’ (GVTs) performance.

The research uncovers a significant positive association between team learning behaviors and global virtual teams’ (GVTs) performance, reinforcing Edmondson’s seminal work. The research findings highlight the significance of team learning behaviors in quantifying variation in global virtual teams’ (GVTs) performance. Despite its modest correlation, team learning behaviors contribute significantly to the variability in performance. This underscores the importance of fostering a culture of continuous learning, seeking feedback and assistance, knowledge sharing, experimentation, and reflection within global virtual teams’ (GVTs).

Jordan and Lawrence (2009) identified emotional intelligence as a significant predictor of team performance, alongside other critical variables. They outlined emotional intelligence into four dimensions: awareness of one’s own emotions, management of one’s own emotions, awareness of others’ emotions, and management of others’ emotions.

Building on this framework, Murmu and Neelam (2022) investigated the influence of emotional intelligence and personality traits on team performance within virtual contexts. Although their study specifically focused on virtual teams, its scope was not global. Nevertheless, their findings indicated a positive correlation between emotional

intelligence and team performance. Similarly, Shafique and Naz (2023) explored the relationship between team emotional intelligence and team performance, focusing on construction projects. Their study revealed a positive association between team emotional intelligence and the performance of engineers involved in such projects.

Expanding upon these investigations, this research bridges the gap by establishing a significant correlation between emotional intelligence and the performance of global virtual teams' (GVTs). This correlation underscores emotional intelligence as a pivotal factor in driving performance within the unique dynamics of global virtual settings. This finding not only contributes to the theoretical understanding of emotional intelligence's impact on global virtual teams' (GVTs) performance but also echoes the conclusions drawn in previous studies (Jordan & Lawrence 2009; Murmu & Neelam 2022). Contrary to previous assumptions, our research suggests that emotional intelligence is equally indispensable for the performance of global virtual teams' (GVTs) as it is for collocated teams, such as those in construction projects.

Friedman (2024) emphasized that trust constitutes the cornerstone of high-performing teams, a notion widely recognized in professional environments. While discussions often focus on building trust within the manager-employee relationship, it's equally crucial to foster trust among team members themselves, considering the collaborative nature of work and the substantial interactions that occur within teams, often independent of managerial oversight.

Morrisette and Kisamore's (2020) meta-analysis illuminates the nexus between trust and performance within business teams, unveiling a consistent positive correlation across diverse team typologies. Their discoveries, fortified by numerous independent investigations, underscore the profound impact of trust within teams on overall performance metrics. It is noteworthy, however, that the scope of this research did not encompass phenomena such as remote teams, virtual teams, or global teams.

Conversely, Erdem and Ozen (2003) delved into the affective and cognitive dimensions of trust within team dynamics, establishing a direct correlation between trust levels and pivotal performance indicators such as planning, problem-solving, and quality enhancement. Their study, focused on industries spanning automotive, metals, electronics, and textiles, examined teams that operate in physically proximate environments.

Synthesizing insights from both inquiries, this study highlights trust as a foundational element in the performance of global virtual teams' (GVTs), spotlighting its statistically significant association with global virtual teams' (GVTs) performance. These findings enrich theoretical frameworks elucidating the pivotal role of trust within globally dispersed work settings, providing guidance for organizational strategies aimed at cultivating trust among global virtual teams' (GVTs) members to optimize team performance.

Team creativity emerges as a significant factor contributing to global virtual teams' (GVTs) performance, corroborating the findings of Yoon et al. (2010). This aspect, while accounting for a notable portion of performance variability, underscores the imperative of nurturing creative environments within virtual teams to foster innovation and achieve success in collaborative endeavors.

Building upon the research conducted by Yoon et al. (2010), this thesis highlights the pivotal role of creativity in the success of global virtual teams' (GVTs). Such emphasis supplements theoretical understandings of knowledge creation and innovation within virtual contexts, proposing strategies to cultivate creative thinking and idea generation within global virtual teams' (GVTs).

Yoon et al. (2010) explored the influence of a supportive learning culture, team creativity, and collaborative knowledge creation practices on team performance. Their findings emphasize that nurturing team creativity alongside a conducive learning culture is indispensable for bolstering collaborative knowledge creation practices and ensuring effective team performance.

However, it's worth noting that Yoon et al.'s study did not explicitly delve into concepts such as remote, virtual, or global teams. In this study, global virtual teams' (GVTs) were engaged in consulting projects focused on international business expansion, where the success heavily hinges on the creative outlook of team members and innovative approaches driving idea generation and problem-solving. This context underscores the necessity of further investigating the role of creativity in global virtual teams' (GVTs) settings.

Collaborative culture emerges as a crucial determinant of global virtual teams' (GVTs) performance, exhibiting a statistically significant positive association. Despite its

moderate correlation, fostering a collaborative environment within virtual teams presents a promising avenue for achieving collective objectives, underscoring the importance of effective teamwork and knowledge integration.

This finding significantly enriches the theoretical discourse on collaborative culture within global virtual teams' (GVTs), diverging from the perspective of Lopez et al. (2004). While Lopez et al. (2004) highlighted the pivotal role of collaborative culture in enhancing organizational learning and subsequently influencing business performance, the study focuses on its direct impact on team performance.

Lopez et al. (2004) conducted an extensive investigation into the influence of collaborative culture on organizational learning and performance across 195 Spanish firms. Employing structural equation modelling (SEM), their empirical findings underscored the pivotal role of collaborative culture in fostering organizational learning, thus significantly impacting business performance.

In crux, the theoretical contributions outlined in this section shed light on the multifaceted dynamics influencing the performance of global virtual teams' (GVTs). By synthesizing insights from various studies spanning team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture, this research advances our understanding of global virtual teams' (GVTs) performance drivers. These contributions not only deepen our theoretical understanding but also lay a foundation for practical interventions aimed at enhancing the performance of global virtual teams' (GVTs) in contemporary organizational landscapes.

In Section 5.2, "Practical Implications", actionable recommendations are outlined for organizations and leaders aiming to improve the performance of global virtual teams' (GVTs). These recommendations focus on fostering learning behaviors, enhancing emotional intelligence, fostering trust among team members, promoting creativity, and nurturing a collaborative culture within teams, all of which contribute to optimizing global virtual teams' (GVTs) performance and attaining desired outcomes.

5.2 Practical Implications

In the pursuit of optimizing the performance of global virtual teams' (GVTs), it becomes essential to transition from theoretical frameworks to actionable strategies. This section delves into practical implications drawn from the exploration of the underlying dynamics

affecting global virtual teams' (GVTs) performance. By distilling insights on team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture, the aim is to provide organizations and leaders with concrete recommendations to navigate the intricacies of contemporary organizational environments effectively.

Fostering a culture of learning within global virtual teams' (GVTs) is pivotal for managers and leaders, with a key focus on understanding and prioritizing psychological safety. This concept, pioneered by Amy Edmondson, emphasizes the significance of team dynamics in facilitating conducive learning behaviors. Psychological safety entails a shared belief among team members that enables them to take risks, express ideas, raise concerns, and admit mistakes without fear of negative repercussions. Operating at the team level, it profoundly influences collective learning dynamics and, consequently, team performance and organizational outcomes. (Gallo 2023)

Within an environment characterized by psychological safety, team members are empowered to engage more fully, drawing upon diverse perspectives to enrich decision-making processes. This heightened engagement fosters intrinsic motivation and a sense of value, facilitating an open exchange of ideas and the exploration of innovative solutions. Moreover, the culture of psychological safety encourages the transparent sharing of mistakes, transforming setbacks into valuable learning opportunities and driving continuous improvement within the team. (Gallo 2023)

The benefits of psychological safety extend beyond immediate team performance to encompass broader organizational outcomes, including enhanced innovation, creativity, and resilience. By prioritizing psychological safety, managers and leaders establish the foundations for sustained success, nurturing a culture of learning and collaboration that propels both present achievements and future endeavors within global virtual teams' (GVTs). (Gallo 2023)

Emotional intelligence has emerged as a pivotal factor, demonstrating twice the significance of other attributes across all job levels, contributing substantially to excellent performance (Goleman 1998, 95). It is inevitable and crucial for global virtual teams' (GVTs) and their performance.

Emotional intelligence plays a vital role for the success of global virtual teams' (GVTs) and their overall performance. It is imperative for managers and leaders to place

emphasis on cultivating emotional intelligence within teams to improve the well-being of workers and cultivate a more emotionally supportive organizational culture. The collective emotional intelligence of a team, coupled with individual employees' emotional responses, shapes the structural dynamics that impact work procedures and the interplay between leadership and team cohesion. (Garmendia & Elorza 2021, 8)

Managers and leaders should prioritize the development of emotional intelligence within their global virtual teams' (GVTs) for several practical reasons. Firstly, while it's vital to understand the task processes that lead to team success, simply identifying them isn't enough. Teams can go through the motions of cooperation and participation without truly engaging. Emotional intelligence fosters the conditions necessary for effective task processes to emerge and for team members to engage wholeheartedly. (Druskat & Wolff 2001, 82)

There are three essential conditions for a teams' effectiveness: trust among members, a sense of group identity, and a sense of group efficacy. Without these, even if team members cooperate and participate on the surface, they may hold back, leading to diminished performance. Therefore, it's crucial for teams to cultivate emotionally intelligent norms - attitudes and behaviors that support building trust, group identity, and group efficacy. (Druskat & Wolff 2001, 82)

Practically speaking, this means that managers and leaders should prioritize activities and initiatives that enhance emotional intelligence within their global virtual teams' (GVTs). This could involve fostering open communication, promoting empathy and understanding among team members, providing opportunities for team bonding and identity formation, and encouraging a sense of collective responsibility and efficacy. By doing so, teams can achieve complete engagement in tasks, leading to greater overall performance and success. (Druskat & Wolff 2001, 82)

Trust is a critical element in the success of Global Virtual Teams' (GVTs). Establishing trust in the workplace isn't solely the responsibility of management; it's a collective effort among all team members. Trust isn't something that can be forced from the top down; rather, it develops naturally based on the actions of everyone in the team. (Friedman 2024)

Managers and leaders play a crucial role in ensuring that teams cultivate trust among themselves by exhibiting key behaviors. These include promoting collaboration, maintaining transparent communication, acknowledging contributions, viewing disagreements as opportunities for growth, and proactively addressing any tensions that arise. These behaviors are pivotal in enhancing the performance of global virtual teams' (GVTs), fostering unity and productivity across various locations and time zones. (Friedman 2024)

Within global virtual teams' (GVTs), fostering creativity holds significant practical implications, necessitating the adoption of strategies that promote innovation across diverse and dispersed environments. Organizational leaders must transcend conventional methods and cultivate an atmosphere conducive to idea generation and exploration, where failure is embraced as an inherent aspect of the creative journey. Strategies like encouraging diverse idea generation, facilitating spaces for experimentation, and fostering open dialogue can significantly enhance team creativity and, consequently, performance. (Utley & Klebahn 2023)

Managers of global virtual teams' (GVTs) need to be aware of organizational structures that may stifle creativity and should assess current procedures to identify and address barriers to innovation. This involves relaxing rigid frameworks during creative sessions, fostering open participation, and promoting constructive conflict to empower team members to challenge norms and pursue unconventional approaches, ultimately driving groundbreaking innovations. (Shambaugh 2019)

Effective collaboration is crucial for fostering team creativity and enhancing the performance of global virtual teams' (GVTs). Companies recognize the importance of instilling a mindset that values team members' contributions, encourages experimentation with diverse ideas, and promotes awareness of how individual actions impact team dynamics and outcomes. To achieve this, organizations implement training programs that focus on key techniques such as active listening, empathy-building, constructive feedback exchange, leadership development, clear communication practices, and fostering mutually beneficial interactions. (Gino 2019)

In essence, the practical implications gleaned from the exploration of factors influencing the performance of global virtual teams' (GVTs) underscore the critical need for organizational leaders and managers to prioritize the cultivation of team learning

behaviors, emotional intelligence, trust, creativity, and collaborative culture within their teams. Fostering an environment where team members feel psychologically safe not only enhances team learning behaviors and team performance but also contributes to broader organizational outcomes such as innovation, resilience, and sustained success. Moreover, prioritizing emotional intelligence and trust-building behaviors among team members, coupled with strategies to foster creativity and effective collaboration, empowers global virtual teams' (GVTs) to overcome challenges, leverage diverse perspectives, and drive meaningful impact in today's dynamic organizational landscapes.

In the forthcoming Section 5.3, "Future Research", the study delves into potential avenues for further investigation, driven by insights gleaned from addressing its limitations and the emergence of new inquiries. These suggestions aim to catalyze future scholarly endeavors, exploring uncharted territories and elucidating intricacies yet to be fully understood within the field.

5.3 Future Research

As the landscape of global virtual teams' (GVTs) continues to evolve, there remains a pressing need to delve deeper into understanding the intricacies of their performance dynamics. While this study has made significant strides in quantifying the influence of team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture on global virtual teams' (GVTs) performance through simple linear regression analysis, several avenues for future research emerge. Given the inherent limitations and new questions raised by this study, further exploration could focus on refining measurement tools, exploring additional factors influencing global virtual teams' (GVTs) performance, and employing more diverse research methodologies to provide a comprehensive understanding of this complex phenomenon.

Future research should focus on refining measurement tools to capture the multifaceted nature of variables such as team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture more accurately. Utilizing validated instruments and incorporating multi-method approaches, including qualitative assessments alongside quantitative surveys, could provide a more comprehensive understanding of these constructs.

While this study identified significant quantifiers of global virtual teams' (GVTs) performance, there may be additional factors influencing performance outcomes that were not included in the analysis. Future research could explore variables such as mindfulness, political skills, well-being, and decision-making to elucidate their impact on global virtual teams' (GVTs) performance. Employing advanced statistical techniques, such as hierarchical regression, multiple linear regression, or structural equation modelling, may facilitate a more nuanced examination of these factors.

To gain deeper insights into global virtual teams' (GVTs) performance dynamics, future research should employ diverse research methodologies beyond quantitative analysis. Integrating qualitative approaches, such as interviews or focus groups, can offer rich contextual insights into the experiences and perceptions of global virtual teams' (GVTs) members. Additionally, longitudinal studies could provide valuable insights into the temporal dynamics of global virtual teams' (GVTs) performance and the effectiveness of interventions over time.

Longitudinal studies tracking global virtual teams' (GVTs) over extended periods can elucidate the long-term effects of interventions aimed at enhancing team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture. By assessing performance trajectories and identifying critical junctures for intervention, researchers can provide evidence-based recommendations for fostering sustainable performance improvements in global virtual teams' (GVTs).

Given the diverse composition of global virtual teams' (GVTs) spanning various cultures and contexts, future research should consider cross-cultural differences in the manifestation and impact of variables such as trust, teamwork, and creativity. Comparative studies across different organizational contexts and geographical regions can shed light on the generalizability of findings and inform tailored strategies for optimizing global virtual teams' (GVTs) performance in diverse settings.

In crux, future research endeavors should strive to deepen our understanding of global virtual teams' (GVTs) performance dynamics by refining measurement tools, exploring additional influencing factors, employing diverse research methodologies, investigating longitudinal effects, and considering cross-cultural and contextual nuances. By addressing these avenues for future research, scholars can contribute to the

development of evidence-based strategies for maximizing the effectiveness of global virtual teams' (GVTs) in achieving organizational goals.

6 Summary

The thesis titled “Quantifying Global Virtual Teams’ (GVTs) Performance Variability” meticulously investigated the correlation between different individual variables and the performance of global virtual teams’ (GVTs). Employing thorough simple linear regression analysis, it endeavored to elucidate the intricate factors impacting global virtual teams’ (GVTs) performance, thereby illuminating the rational dimensions of team dynamics crucial for organizational success in today’s global virtual landscape.

Furthermore, through individual examination of the effects of team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture on the performance of global virtual teams’ (GVTs), the study sought to offer practical insights for organizational managers and leaders endeavoring to enhance team effectiveness across diverse geographical locations. This methodical inquiry underscored the significance of decision-making based on research and strategic interventions customized to the unique challenges of global virtual team environments.

Throughout the analysis, the study uncovers notable positive correlations between individual variables - team learning behaviors, emotional intelligence, trust, team creativity, and collaborative culture - and the performance of global virtual teams’ (GVTs). These empirical discoveries underscore the interconnectedness of diverse team dynamics, emphasizing the necessity of a comprehensive approach to enhance global virtual teams’ (GVTs) performance in fulfilling organizational objectives.

Moreover, the recognition of a substantial positive correlation between team learning behaviors and the performance of global virtual teams’ (GVTs) highlights the importance of fostering a culture of ongoing learning and knowledge exchange within virtual teams. However, it also prompts additional investigation into the relationships between learning behaviors and other determinants of global virtual teams’ (GVTs) performance, urging researchers and practitioners to explore the underlying mechanisms further.

Emotional intelligence emerges as a pivotal predictor of global virtual teams’ (GVTs) performance, emphasizing the significant impact of comprehending and regulating emotions within such team settings. While recognizing the importance of emotional intelligence training, organizational managers and leaders must also take into

account the broader organizational culture and structural elements that shape emotional dynamics within global virtual teams' (GVTs). This underscores the necessity for a comprehensive approach to talent development and team management.

Furthermore, the study's discoveries concerning the significance of trust in enhancing the performance of global virtual teams' (GVTs) resonate with established literature on team efficacy, emphasizing the pivotal role of trust in fostering collaboration and attaining collective objectives. Nonetheless, it also underscores the hurdles inherent in cultivating trust within global virtual teams' (GVTs), emphasizing the necessity of proactive communication, transparency, and continual alignment of actions with organizational values and goals.

The correlation between team creativity and the performance of global virtual teams' (GVTs) not only highlights the significance of innovation within virtual team environments but also prompts examination of factors that either enable or hinder creative expression within dispersed teams. Through promoting experimentation, valuing diverse perspectives, and allocating resources for idea realization, organizations can leverage the creative capabilities of global virtual teams' (GVTs) to cultivate a sustainable competitive edge in an ever-changing business environment.

Moreover, the study's focus on fostering a collaborative culture within global virtual teams' (GVTs) resonates with the increasing acknowledgment of the significance of teamwork and knowledge amalgamation in enhancing organizational effectiveness. However, it also underscores the imperative for organizational leaders to actively confront obstacles to collaboration, including cultural disparities, time zone discrepancies, and technological limitations, through tailored interventions and infrastructure support.

The thesis highlights the comprehensive view necessary for effective management of virtual teams, emphasizing the intricate nature of global virtual teams' (GVTs) dynamics. This challenges organizations to embrace integrative strategies that accommodate the diverse requirements inherent in global virtual teams' (GVTs) contexts. Through a commitment to practices grounded in evidence, leveraging technology-driven communication tools, and fostering continuous professional growth, organizations can enable global virtual teams' (GVTs) to excel in today's interconnected global landscape.

In conclusion, the thesis provides a comprehensive synthesis of theoretical insights beneficial to both researchers and practitioners, along with practical implications valuable for managers and leaders. This synthesis offers a clear pathway for addressing the intricate dynamics of global virtual teams' (GVTs), assisting in strategic decision-making, and directing interventions aimed at improving team performance and organizational objectives. As organizations increasingly prioritize virtual collaboration, the lessons derived from this research serve as invaluable guidance for enhancing the effectiveness of global virtual teams' (GVTs), fostering innovation, agility, and long-term competitive advantage.

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Appendices

Survey Questionnaires

Team Learning Behaviors

Survey#	Team Learning Behaviors (Internal)	Instructions	Reverse Code
4		Please state to what extent these statements describe your team. NOTE: (R) represents reverse scored statements	YES NO
Scale: 1 = Very Inaccurate, 2, 3, 4 = Neutral, 5, 6, 7 = Very Accurate			
1	TLBI1	TLBI1. Problems and errors in this team are always communicated to the appropriate people (whether team members or others) so that action can be taken.	NO
2	TLBI2	TLBI2. We often take time to figure out ways to improve our team's work processes.	NO
3	TLBI3	TLBI3. In this team, people talk about mistakes and ways to prevent and learn from them.	NO
4	TLBI4	TLBI4. This team tends to handle conflicts and differences of opinion privately or off-line, rather than addressing them directly as a group. (R)	YES
5	TLBI5	TLBI5. This team frequently obtains new information that leads us to make important changes in our plans or work processes.	NO

6	TLBI6	TLBI6. Members of this team often raise concerns they have about team plans or decisions.	NO
7	TLBI7	TLBI7. This team constantly encounters unexpected hurdles and gets stuck. (R)	YES
8	TLBI8	TLBI8. We try to discover assumptions or basic beliefs about issues under discussion.	NO
Literature Reference		Edmondson 1999	
Edmondson, A. (1999). Psychological safety and learning behavior in work teams. <i>Administrative science quarterly</i> , 44(2), 350-383.			

Survey#	Team Learning Behaviors (External): TLBE	Instructions	Reverse Code
4		Please state to what extent these statements describe your team. NOTE: (R) represents reverse scored statements	YES NO
Scale: 1 = Very Inaccurate, 2, 3, 4 = Neutral, 5, 6, 7 = Very Accurate			
1	TLBE1	TLBE1. People in this team frequently coordinate with other teams to meet organization objectives.	NO
2	TLBE2	TLBE2. People in this team cooperate effectively with other teams or shifts to meet corporate objectives or satisfy customer needs.	NO

3	TLBE3	TLBE3. This team is not very good at keeping everyone informed who needs to buy in to what the team is planning and accomplishing. (R)	YES
4	TLBE4	TLBE4. This team goes out and gets all the information it possibly can from a lot of different sources.	NO
5	TLBE5	TLBE5. We don't have time to communicate information about our team's work to others outside the team. (R)	YES
6	TLBE6	TLBE6. We invite people from outside the team to present information or have discussions with us.	NO
Literature Reference		Edmondson 1999	
Edmondson, A. (1999). Psychological safety and learning behavior in work teams. <i>Administrative science quarterly</i> , 44(2), 350-383.			

Team Learning Outcomes

Survey#	Team Learning Outcomes: TLO	Instructions	Reverse Code YES NO
4		Please state to what extent these statements describe your team. NOTE: (R) represents reverse scored statements	
Scale: 1 = Very Inaccurate, 2, 3, 4 = Neutral, 5, 6, 7 = Very Accurate			
1	TLO1	TLO1. Members of this team help others understand their special areas of expertise.	NO

2	TLO2	TLO2. Working with this team, I have gained a significant understanding of other areas of expertise.	NO
3	TLO3	TLO3. The outcomes or products of our work include new processes or procedures.	NO
Literature Reference		Edmondson 1999	
Edmondson, A. (1999). Psychological safety and learning behavior in work teams. <i>Administrative science quarterly</i> , 44(2), 350-383.			

Emotional Intelligence

Survey# 4	Team Emotional Intelligence	Instructions	Reverse Code
		More about your teamwork. How frequently do you perceive the following.	YES NO
Scale: 1 = Never, 2, 3, 4, 5 = Frequently			
Awareness of Own Emotions (AWR) (Jordan and Lawrence 2009)			
1	WEIP-S1	AWR1. I can explain the emotions I feel to team members.	NO
2	WEIP-S2	AWR2. I can discuss the emotions I feel with team members.	NO
3	WEIP-S3	AWR3. If I feel down, I can tell team members what will make me feel better.	NO
4	WEIP-S4	AWR4. I can talk to other members of the team about the emotions I experience.	NO
Management of Own Emotions (MGT) (Jordan and Lawrence 2009)			

5	WEIP-S5	MGT1. I respect the opinion of team members, even if I think they are wrong.	NO
6	WEIP-S6	MGT2. When I am frustrated with fellow team members, I can overcome my frustration.	NO
7	WEIP-S7	MGT3. When deciding on a dispute, I try to see all sides of a disagreement before I come to a conclusion.	NO
8	WEIP-S8	MGT4. I give a fair hearing to fellow team members' idea.	NO
Awareness of Others' Emotions (AWRO) (Jordan and Lawrence 2009)			
9	WEIP-S9	AWRO1. I can read fellow team members 'true' feelings, even if they try to hide them.	NO
10	WEIP-S10	AWRO2. I am able to describe accurately the way others in the team are feeling.	NO
11	WEIP-S11	AWRO3. When I talk to a team member I can gauge their true feelings from their body language.	NO
12	WEIP-S12	AWRO4. I can tell when team members don't mean what they say.	NO
Management of Others' Emotions (MGTO) (Jordan and Lawrence 2009)			
13	WEIP-S13	MGTO1. My enthusiasm can be contagious for members of a team.	NO

14	WEIP-S14	MGTO2. I am able to cheer team members up when they are feeling down.	NO
15	WEIP-S15	MGTO3. I can get fellow team members to share my keenness for a project.	NO
16	WEIP-S16	MGTO4. I can provide the 'spark' to get fellow team members enthusiastic.	NO
Jordan, P. J., & Lawrence, S. A. (2009). Emotional intelligence in teams: Development and initial validation of the short version of the Workgroup Emotional Intelligence Profile (WEIP-S). <i>Journal of Management and Organization</i> , 15(4), 452.			

Trust

Survey# 4	Trust	Instructions	Reverse Code
		More about your teamwork. How frequently do you perceive the following.	YES NO
Scale: 1 = Never, 2, 3, 4, 5 = Frequently			
Affective Trust (AT) (McAllister 1995)			
17	AT1	AT1. We have a sharing relationship We can all freely share our ideas, feelings, and hopes.	NO
18	AT2	AT2. I can talk freely to my team members about difficulties I am having at school and know that they will want to listen.	NO
19	AT3	AT3. If I shared my problems with my team members, I know they would respond constructively and caringly.	NO

Cognitive Trust (CT) (McAllister 1995)			
20	CT1	CT1. Team members approach this project with professionalism and dedication.	NO
21	CT2	CT2. Given my team members' track records, I see no reason to doubt their competence and preparation for the project.	NO
22	CT3	CT3. I can rely on team members not to make our project more difficult by careless work.	NO
McAllister, D. J. (1995). Affect-based and Cognition-based trust as foundations for interpersonal cooperation in organizations. <i>Academy of management journal</i> , 38(1), 24-59.			

Team Creativity

Survey# 4	Team Creativity	Instructions	Reverse Code
		More about your teamwork. How frequently do you perceive the following.	YES NO
Scale: 1 = Never, 2, 3, 4, 5 = Frequently			
Team Creativity (TC) (Rego et al. 2007)			
23	TC1	TC1. My team members suggest new ways to achieve goals or objectives.	NO
24	TC2	TC2. My team members come up with new and practical ideas to improve performance.	NO

25	TC3	TC3. My team members suggest new ways to increase quality.	NO
26	TC4	TC4. My team members promote and champion ideas to others.	NO
27	TC5	TC5. My team members exhibit creativity when given the opportunity to.	NO
28	TC6	TC6. My team members develop adequate plans and schedules for the implementation of new ideas.	NO
29	TC7	TC7. My team members have new and innovative ideas.	NO
30	TC8	TC8. My team members come up with creative solutions to problems.	NO
<p>Rego, A., Sousa, F., Pina e Cunha, M., Correia, A., & Saur-Amaral, I. (2007). Leader self-reported emotional intelligence and perceived employee creativity: An exploratory study. <i>Creativity and innovation management</i>, 16(3), 250-264.</p>			

Collaborative Culture

Survey# 4	Collaborative Culture (CC)	Instructions	Reverse Code
		More about your teamwork. How frequently do you perceive the following.	YES NO
<p>Scale: 1 = Never, 2, 3, 4, 5 = Frequently</p>			
<p>Collaborative Culture (CC) (Lopez et al. 2004)</p>			
31	CC1	CC1. My team considers change to be natural and necessary.	NO

32	CC2	CC2. My team considers individuals as an asset and tries to appreciate them continuously.	NO
33	CC3	CC3. Individuals who experiment and take reasonable risks are well-considered by the team even if they are mistaken.	NO
34	CC4	CC4. The preservation of different points of view is encouraged.	NO
35	CC5	CC5. Everybody's opinions and contributions are respected.	NO
36	CC6	CC6. Problems are discussed openly, to avoid finding culprits.	NO
37	CC7	CC7. Collaboration and co-operation among team members is encouraged.	NO
38	CC8	CC8. All team members are aware of instructor expectations.	NO
Literature Reference		WEIP-S (Jordan & Lawrence 2009) Affective Trust & Cognitive Trust (McAllister 1995) Team Creativity: TC (Rego et al. 2007) Collaborative Culture: CC (Lopez et al. 2004)	
López, S. P., Peón, J. M. M., & Ordás, C. J. V. (2004). Managing knowledge: the link between culture and organizational learning. <i>Journal of knowledge management</i> .			

Data Analysis Output

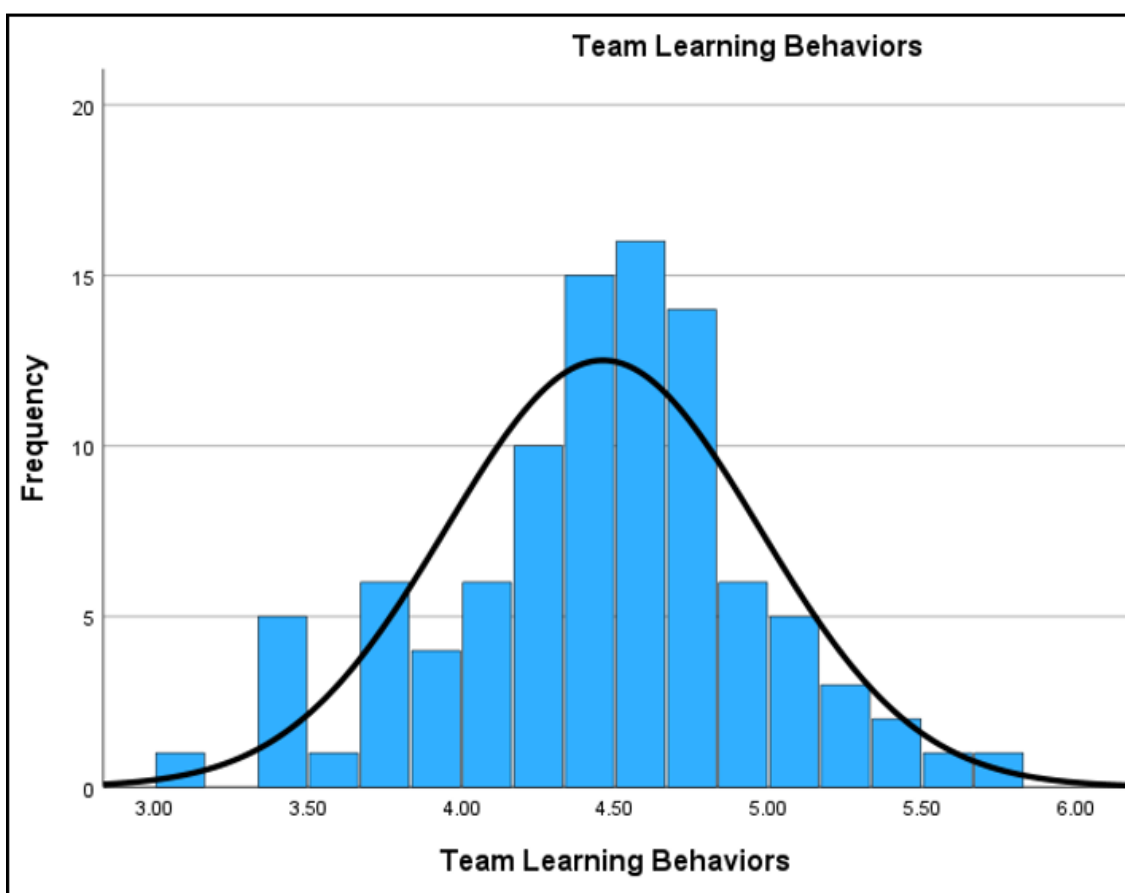
Cronbach's Alpha Analysis

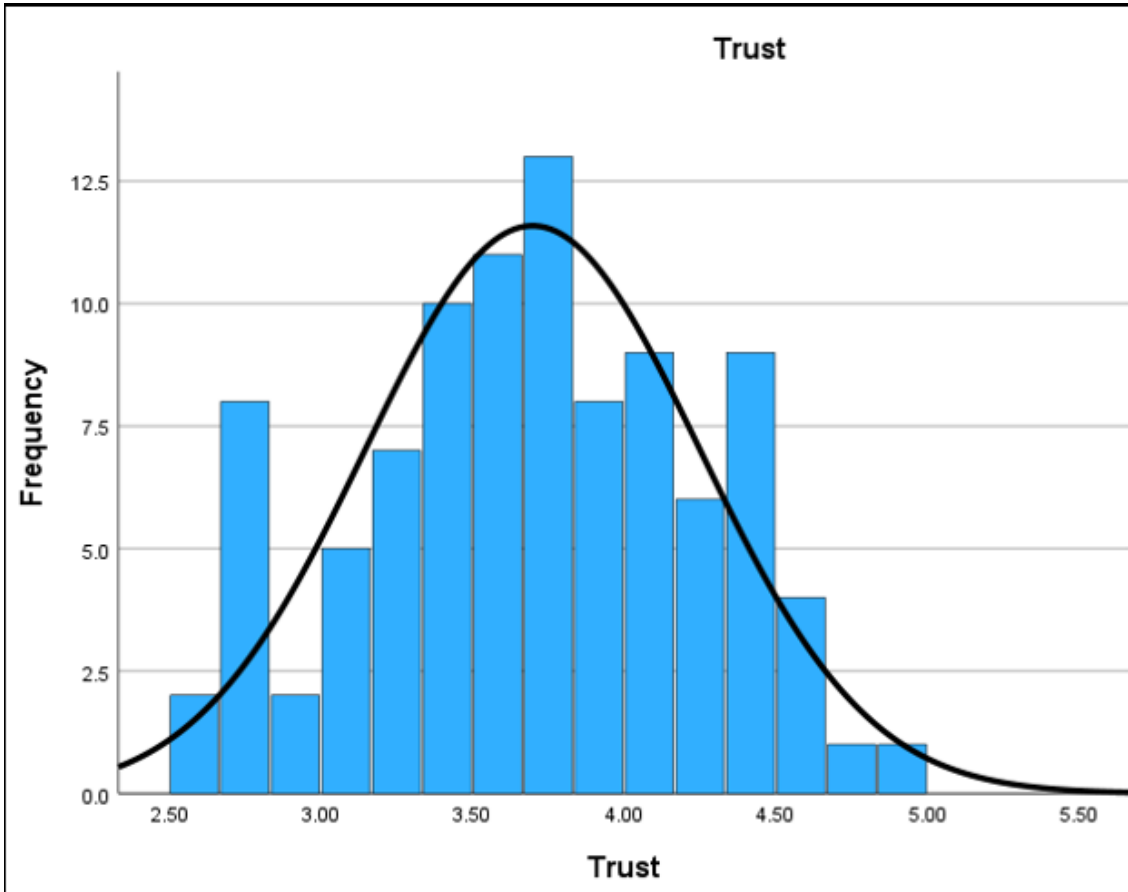
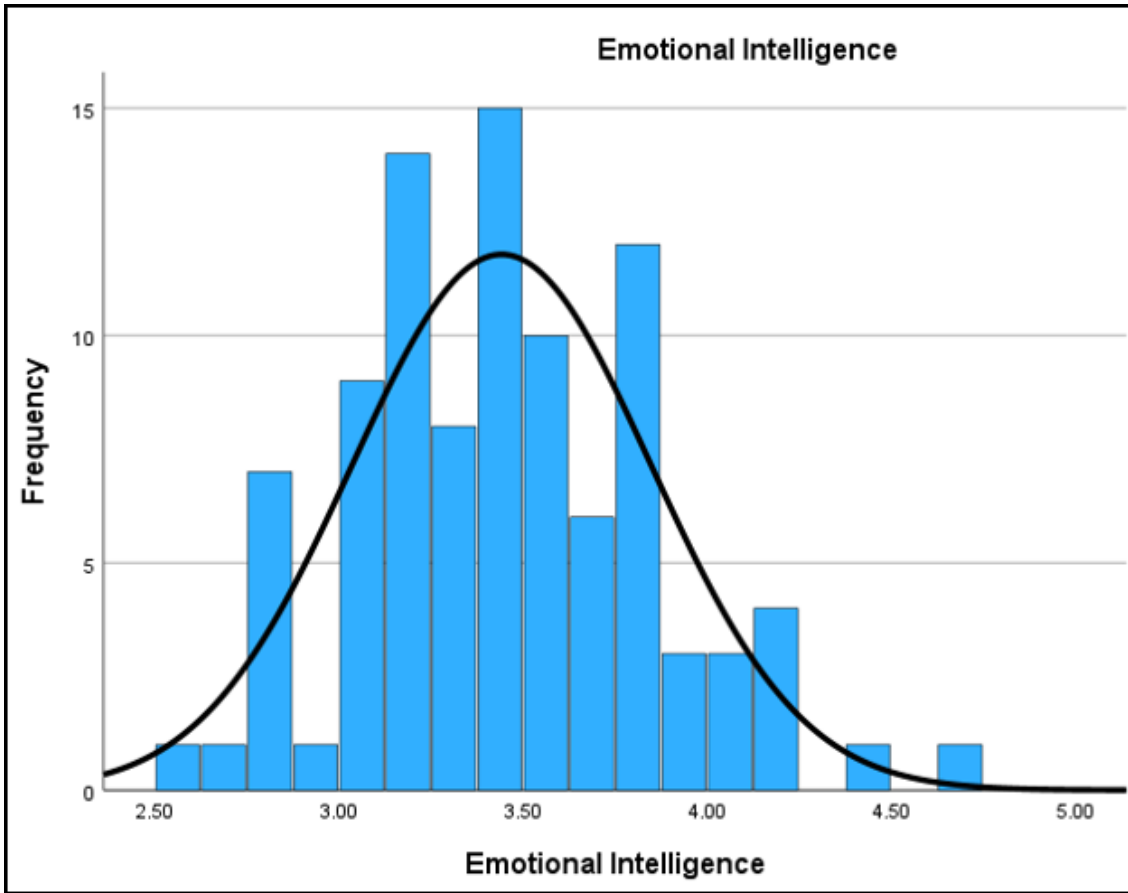
Team Learning Behaviors	<p style="text-align: center;">Reliability Statistics</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Cronbach's Alpha</th> <th style="text-align: center;">N of Items</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">.812</td> <td style="text-align: center;">14</td> </tr> </tbody> </table>	Cronbach's Alpha	N of Items	.812	14
Cronbach's Alpha	N of Items				
.812	14				
Emotional Intelligence	<p style="text-align: center;">Reliability Statistics</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Cronbach's Alpha</th> <th style="text-align: center;">N of Items</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">.915</td> <td style="text-align: center;">16</td> </tr> </tbody> </table>	Cronbach's Alpha	N of Items	.915	16
Cronbach's Alpha	N of Items				
.915	16				
Trust	<p style="text-align: center;">Reliability Statistics</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Cronbach's Alpha</th> <th style="text-align: center;">N of Items</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">.865</td> <td style="text-align: center;">6</td> </tr> </tbody> </table>	Cronbach's Alpha	N of Items	.865	6
Cronbach's Alpha	N of Items				
.865	6				
Team Creativity	<p style="text-align: center;">Reliability Statistics</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Cronbach's Alpha</th> <th style="text-align: center;">N of Items</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">.950</td> <td style="text-align: center;">8</td> </tr> </tbody> </table>	Cronbach's Alpha	N of Items	.950	8
Cronbach's Alpha	N of Items				
.950	8				
Collaborative Culture	<p style="text-align: center;">Reliability Statistics</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Cronbach's Alpha</th> <th style="text-align: center;">N of Items</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">.899</td> <td style="text-align: center;">8</td> </tr> </tbody> </table>	Cronbach's Alpha	N of Items	.899	8
Cronbach's Alpha	N of Items				
.899	8				

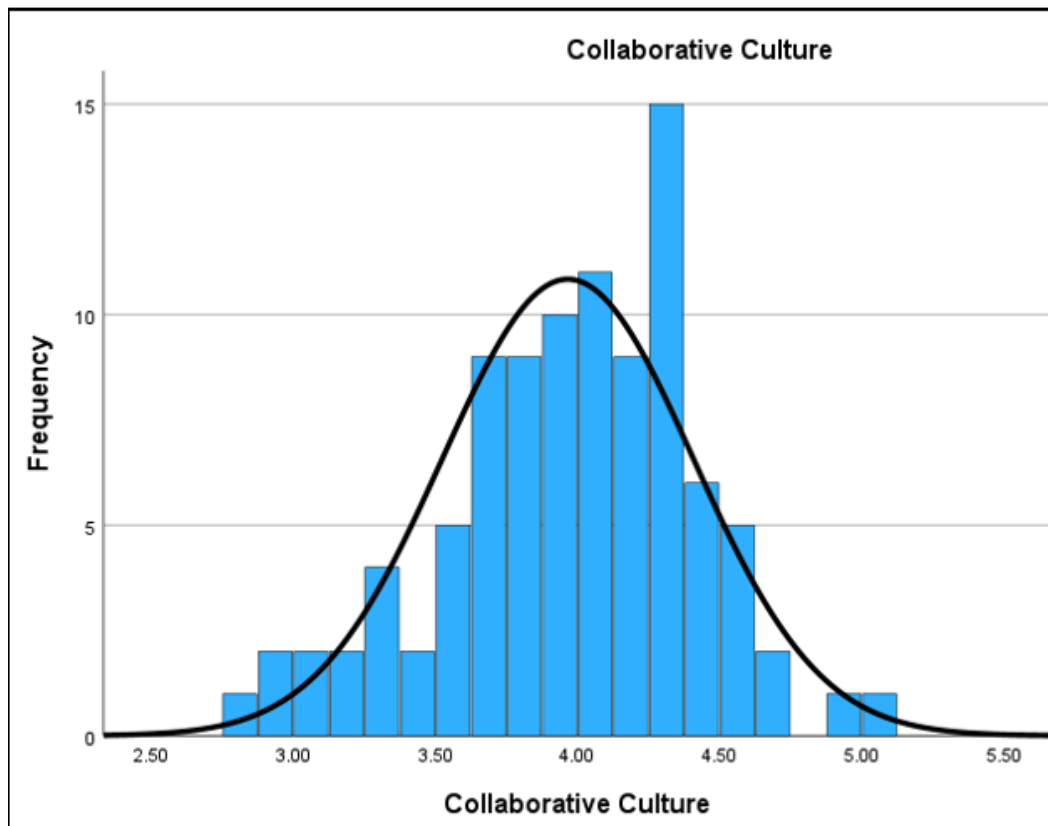
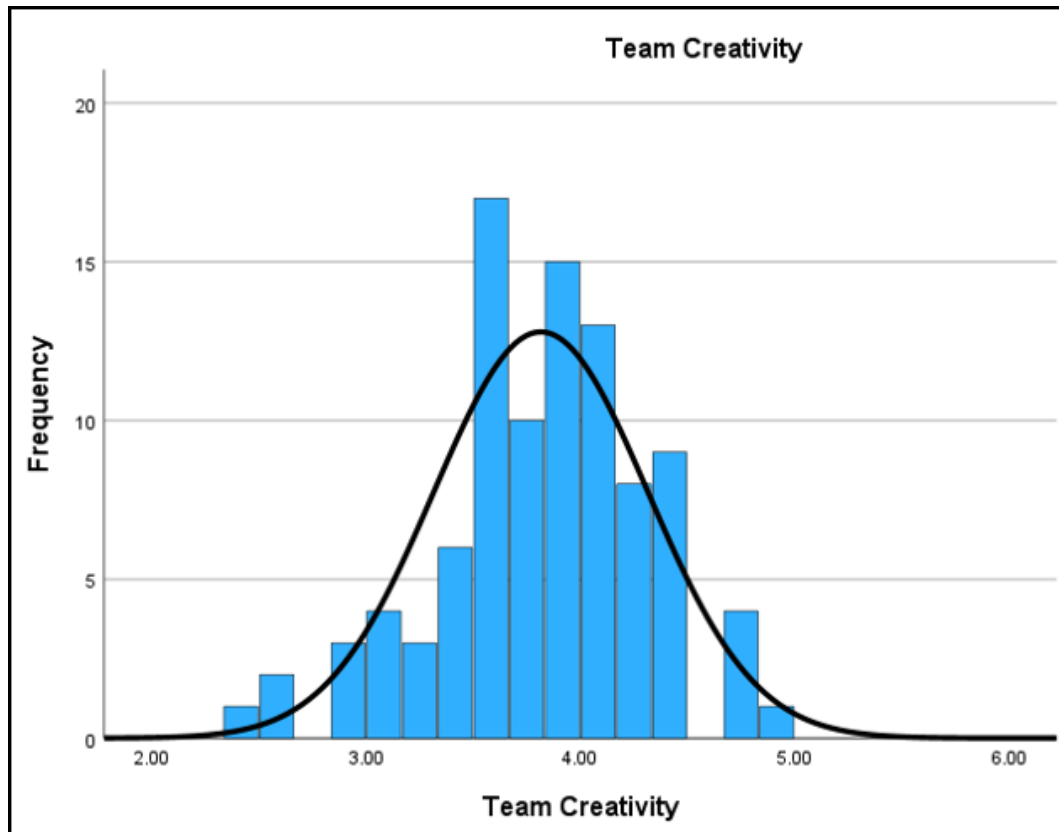
Descriptive Statistics

		Statistics				
		Team Learning Behaviors	Emotional Intelligence	Trust	Team Creativity	Collaborative Culture
N	Valid	96	96	96	96	96
	Missing	0	0	0	0	0
Mean		4.4602	3.4419	3.6977	3.8154	3.9661
Median		4.5042	3.4063	3.7044	3.8475	4.0023
Mode		4.62 ^a	3.38	2.71 ^a	3.40 ^a	4.15
Std. Deviation		.51030	.40630	.55079	.49900	.44158
Variance		.260	.165	.303	.249	.195
Skewness		-.274	.332	-.089	-.344	-.439
Std. Error of Skewness		.246	.246	.246	.246	.246
Kurtosis		.208	.031	-.568	.439	-.022
Std. Error of Kurtosis		.488	.488	.488	.488	.488
Range		2.62	2.05	2.37	2.66	2.15

a. Multiple modes exist. The smallest value is shown







Regression Statistics

Team Learning Behaviors

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.275 ^a	.076	.066	10.039

a. Predictors: (Constant), Team Learning Behaviors

b. Dependent Variable: Team Performance

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	775.852	1	775.852	7.698	.007 ^b
	Residual	9473.482	94	100.782		
	Total	10249.333	95			

a. Dependent Variable: Team Performance

b. Predictors: (Constant), Team Learning Behaviors

Coefficients^a

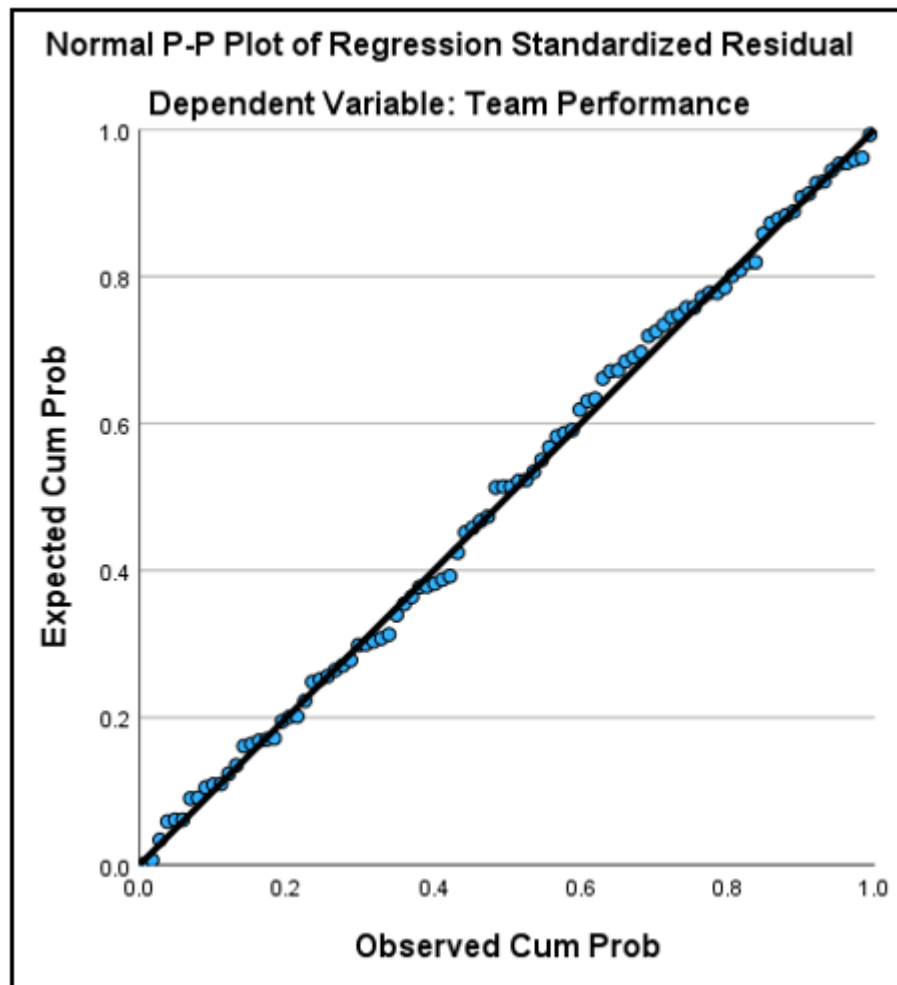
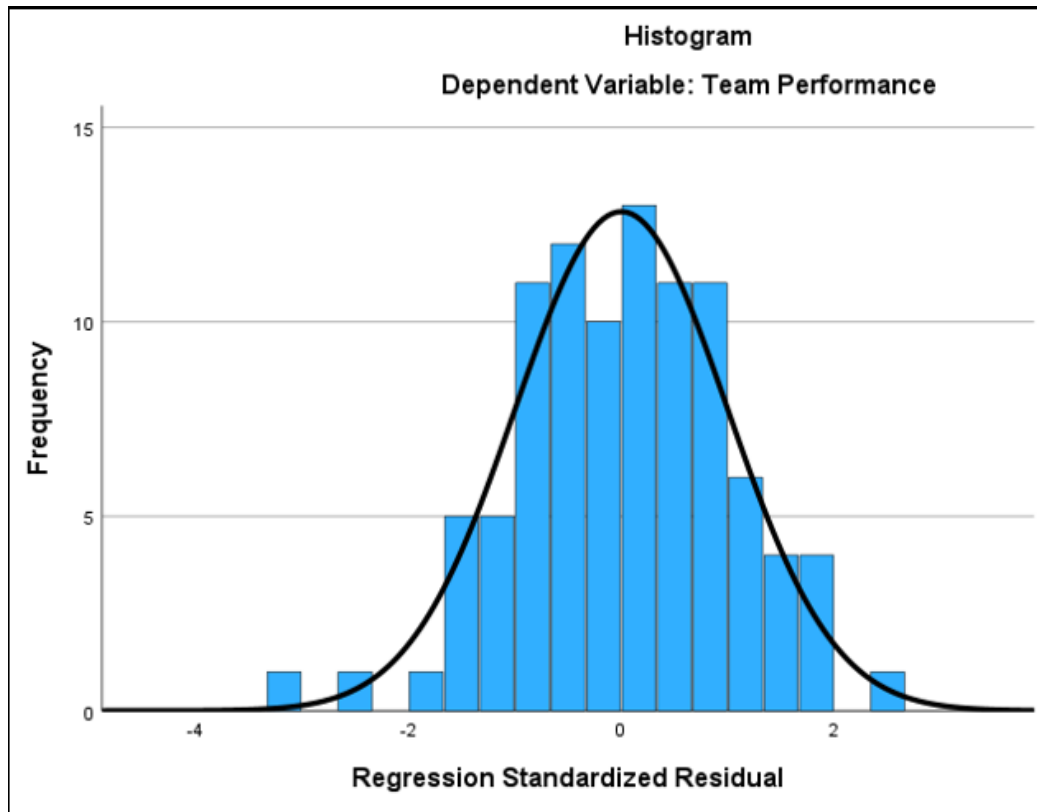
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	52.939	9.061		5.843	<.001
	Team Learning Behaviors	5.600	2.018	.275	2.775	.007

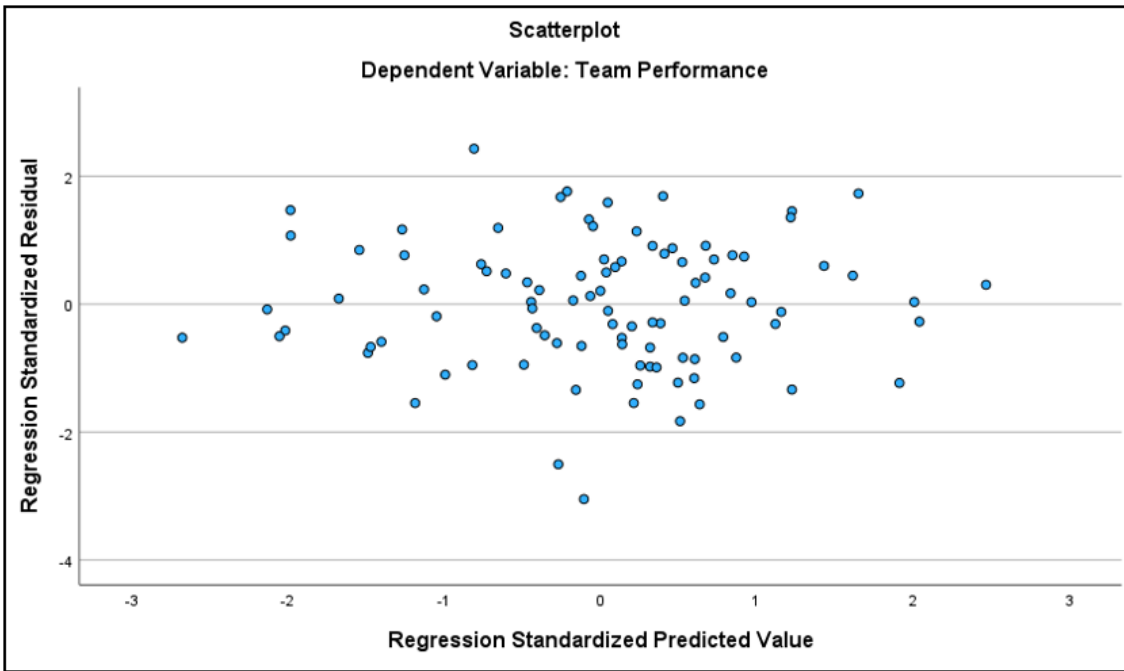
a. Dependent Variable: Team Performance

Residuals Statistics^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	70.27	84.97	77.92	2.858	96
Residual	-30.614	24.395	.000	9.986	96
Std. Predicted Value	-2.675	2.467	.000	1.000	96
Std. Residual	-3.050	2.430	.000	.995	96

a. Dependent Variable: Team Performance





Emotional Intelligence

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.291 ^a	.085	.075	9.990

a. Predictors: (Constant), Emotional Intelligence
b. Dependent Variable: Team Performance

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	867.670	1	867.670	8.694	.004 ^b
	Residual	9381.663	94	99.805		
	Total	10249.333	95			

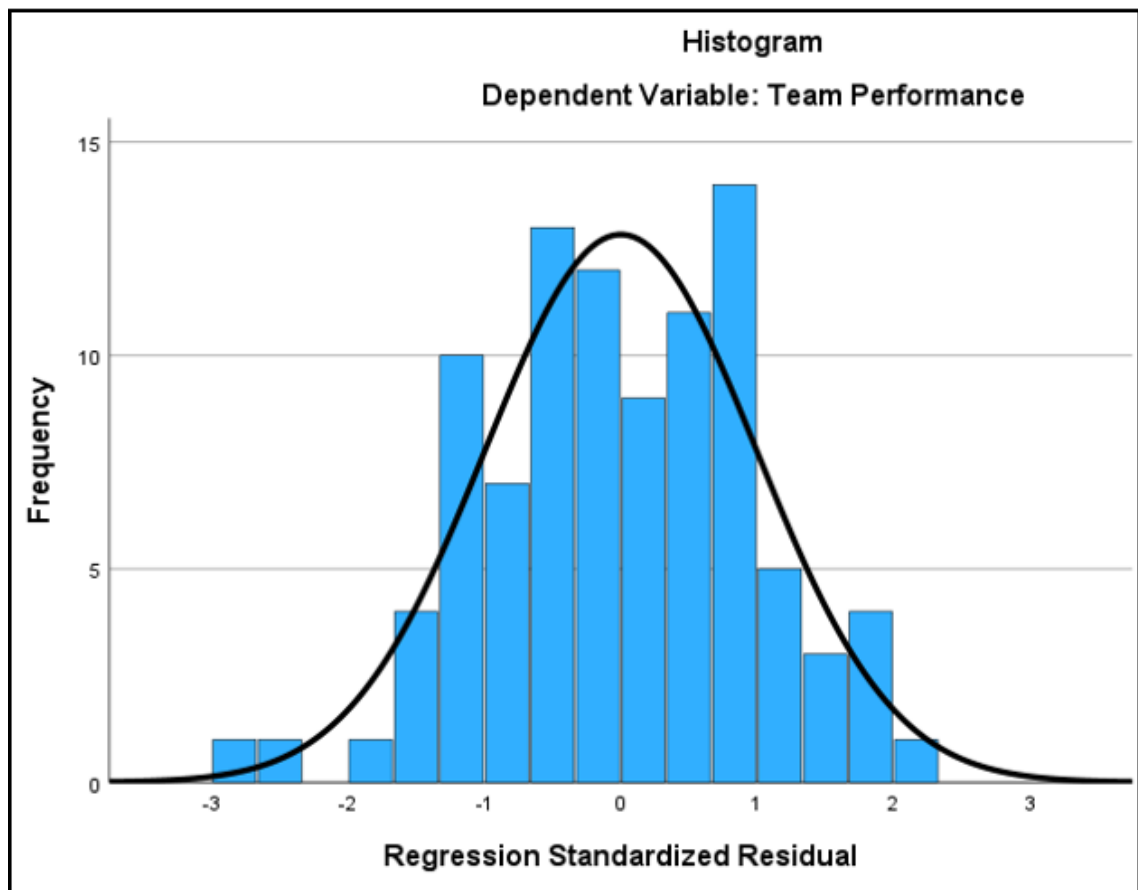
a. Dependent Variable: Team Performance
b. Predictors: (Constant), Emotional Intelligence

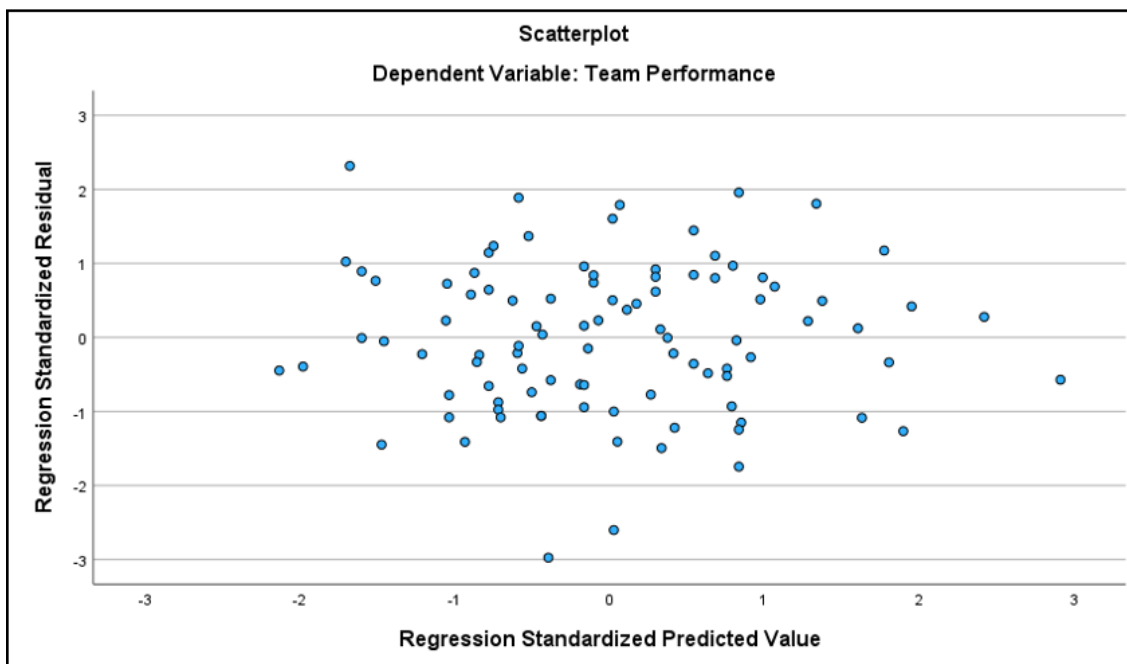
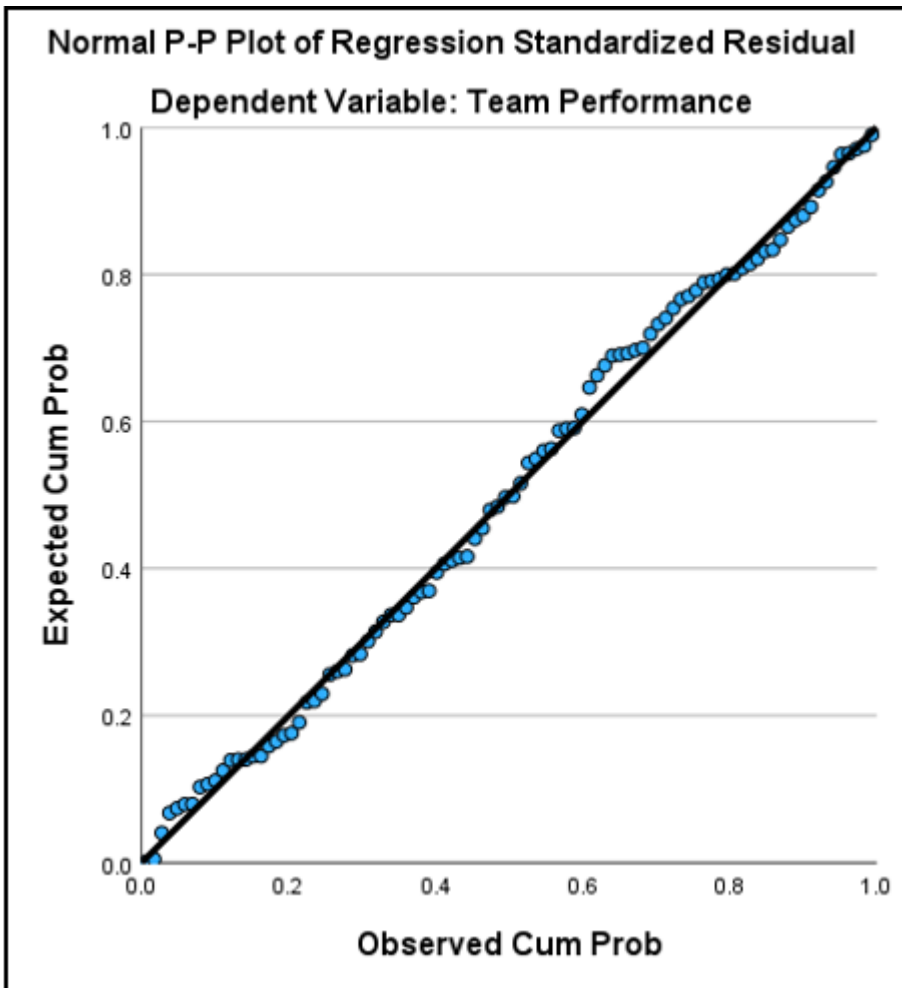
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	52.315	8.743		5.984	<.001
	Emotional Intelligence	7.438	2.523	.291	2.949	.004

a. Dependent Variable: Team Performance

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	71.47	86.72	77.92	3.022	96
Residual	-29.722	23.152	.000	9.938	96
Std. Predicted Value	-2.134	2.912	.000	1.000	96
Std. Residual	-2.975	2.317	.000	.995	96

a. Dependent Variable: Team Performance





Trust

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.273 ^a	.075	.065	10.044

a. Predictors: (Constant), Trust

b. Dependent Variable: Team Performance

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	765.634	1	765.634	7.589	.007 ^b
	Residual	9483.699	94	100.890		
	Total	10249.333	95			

a. Dependent Variable: Team Performance

b. Predictors: (Constant), Trust

Coefficients^a

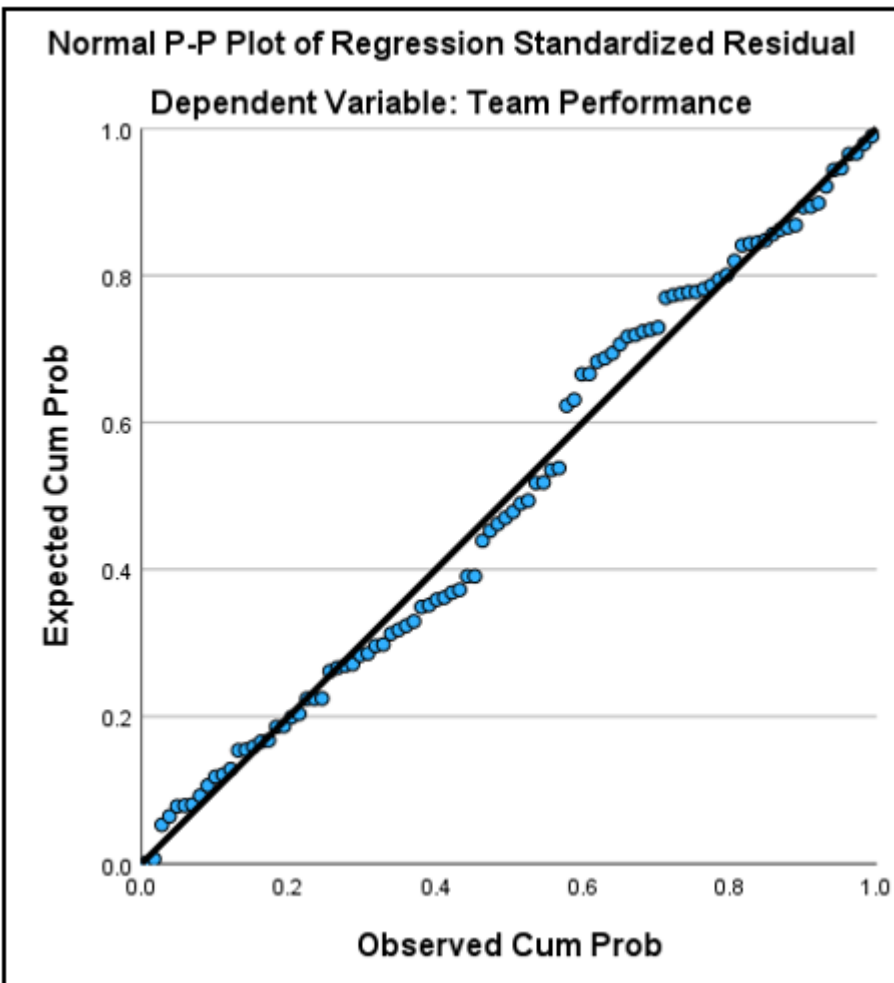
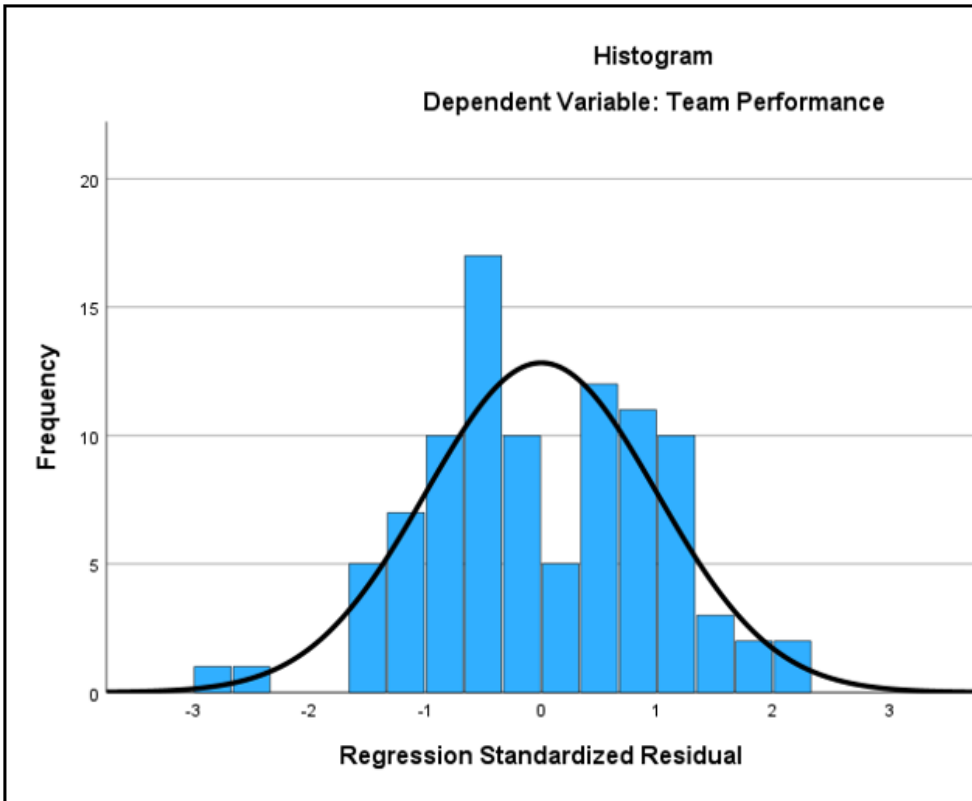
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	58.858	6.994		8.415	<.001
	Trust	5.154	1.871	.273	2.755	.007

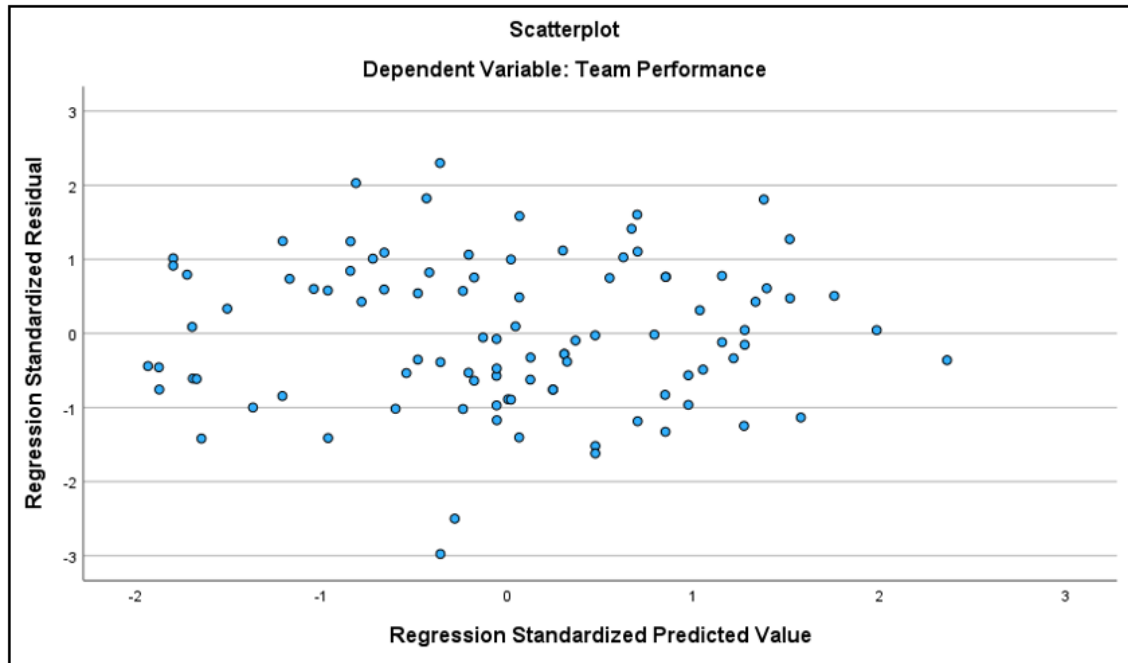
a. Dependent Variable: Team Performance

Residuals Statistics^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	72.43	84.63	77.92	2.839	96
Residual	-29.897	23.109	.000	9.991	96
Std. Predicted Value	-1.931	2.364	.000	1.000	96
Std. Residual	-2.977	2.301	.000	.995	96

a. Dependent Variable: Team Performance





Team Creativity

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.293 ^a	.086	.076	9.984

a. Predictors: (Constant), Team Creativity
b. Dependent Variable: Team Performance

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	880.031	1	880.031	8.829	.004 ^b
	Residual	9369.302	94	99.673		
	Total	10249.333	95			

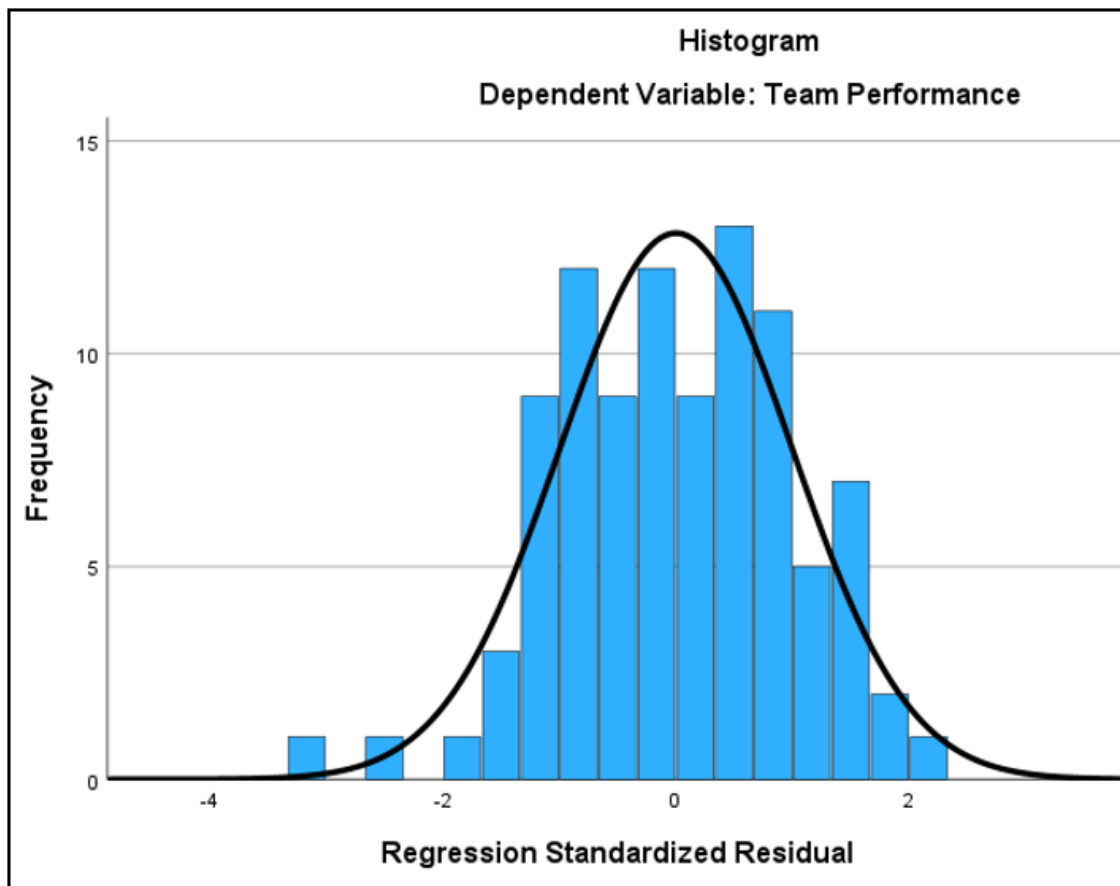
a. Dependent Variable: Team Performance
b. Predictors: (Constant), Team Creativity

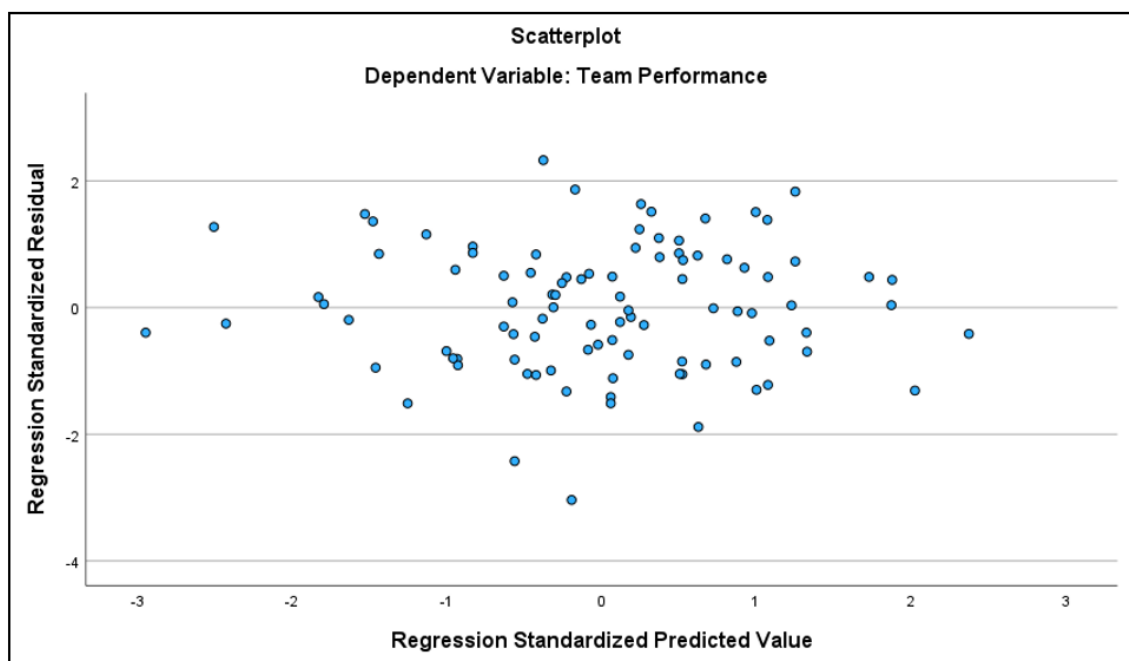
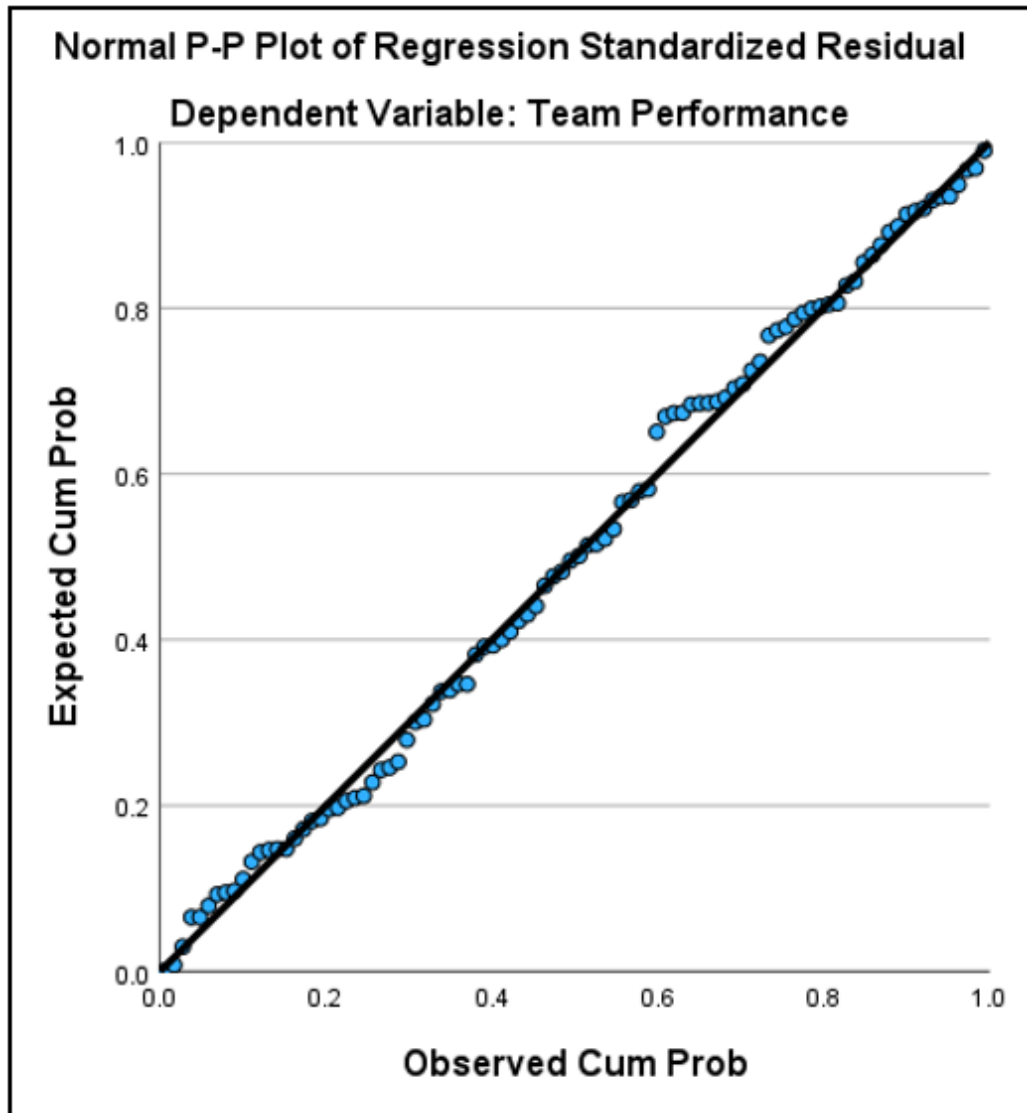
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	54.645	7.898		6.919	<.001
	Team Creativity	6.099	2.053	.293	2.971	.004

a. Dependent Variable: Team Performance

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	68.95	85.14	77.92	3.044	96
Residual	-30.327	23.229	.000	9.931	96
Std. Predicted Value	-2.947	2.374	.000	1.000	96
Std. Residual	-3.038	2.327	.000	.995	96

a. Dependent Variable: Team Performance





Collaborative Culture

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.256 ^a	.065	.055	10.095

a. Predictors: (Constant), Collaborative Culture

b. Dependent Variable: Team Performance

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	670.261	1	670.261	6.577	.012 ^b
	Residual	9579.072	94	101.905		
	Total	10249.333	95			

a. Dependent Variable: Team Performance

b. Predictors: (Constant), Collaborative Culture

Coefficients^a

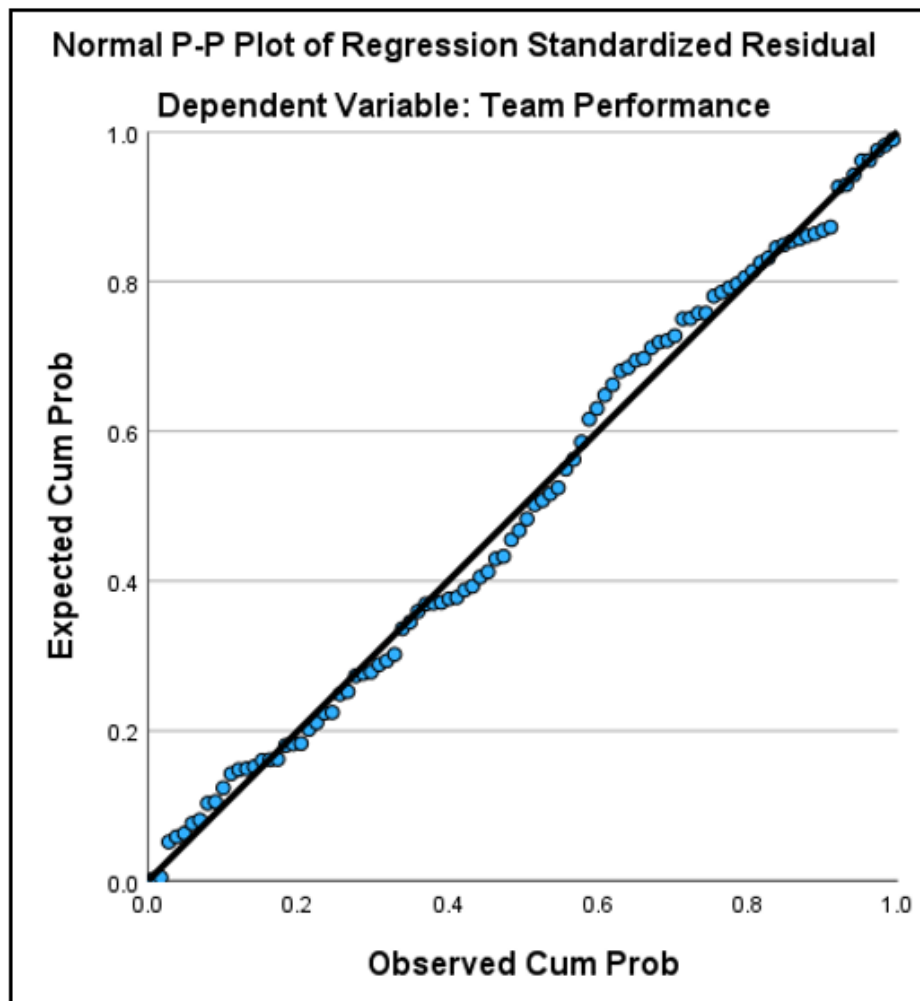
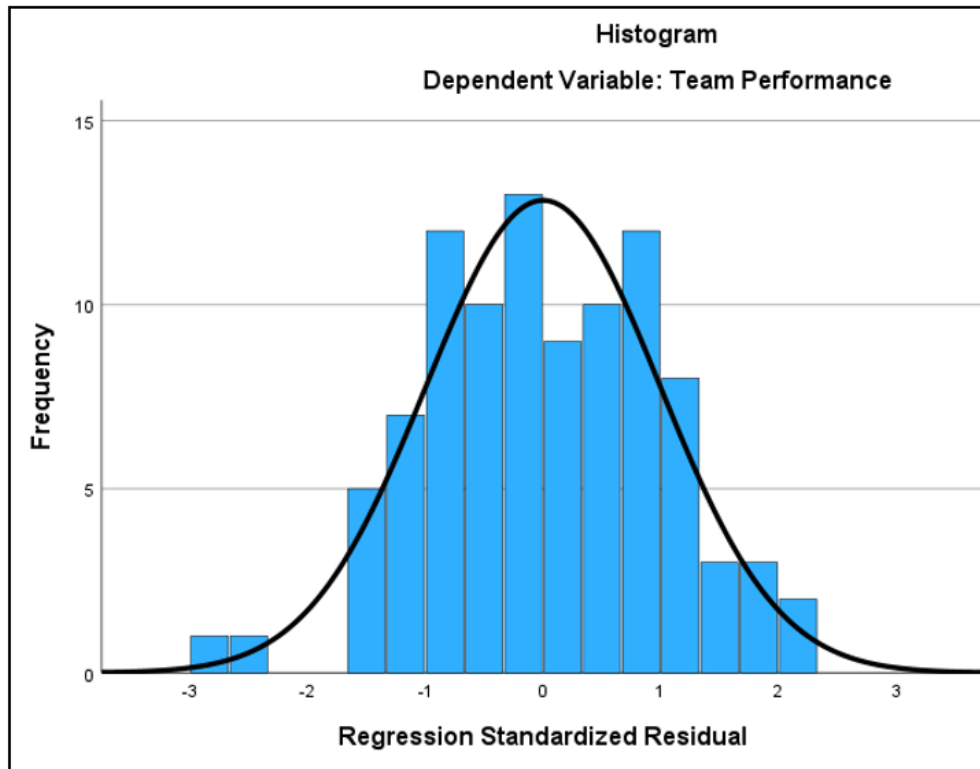
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	54.060	9.359		5.776	<.001
	Collaborative Culture	6.015	2.345	.256	2.565	.012

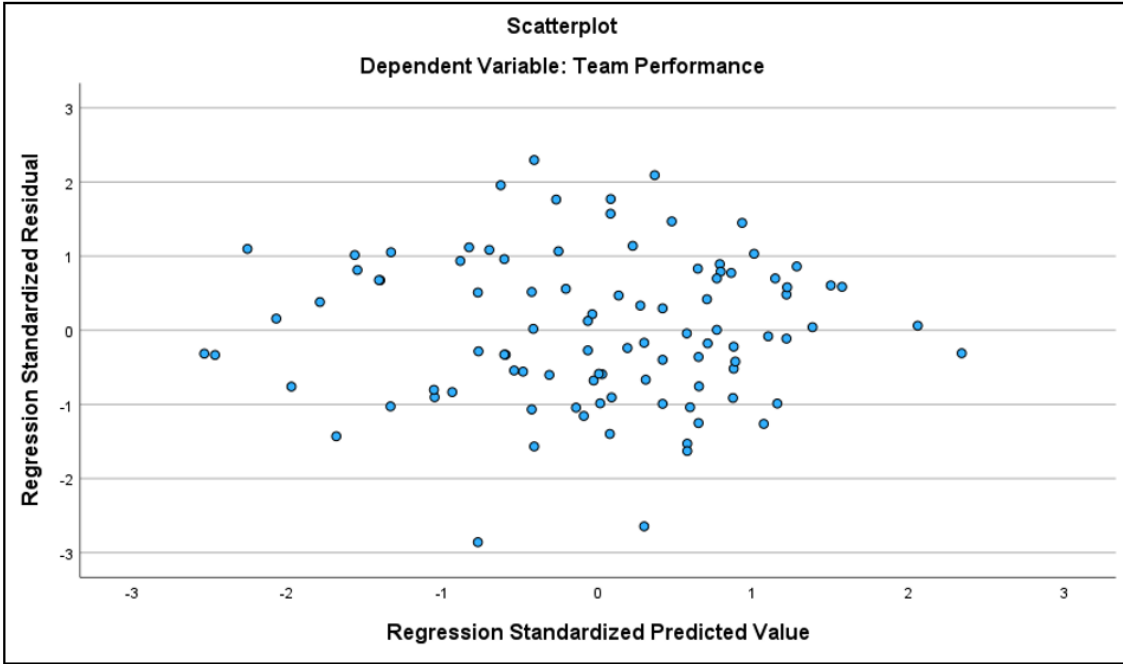
a. Dependent Variable: Team Performance

Residuals Statistics^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	71.19	84.14	77.92	2.656	96
Residual	-28.865	23.173	.000	10.042	96
Std. Predicted Value	-2.533	2.341	.000	1.000	96
Std. Residual	-2.859	2.296	.000	.995	96

a. Dependent Variable: Team Performance





Data Consent Protocol

Consent for the Storage and Use of Data.

Turku School of Economics, University of Turku, Finland

Name of Business School, Name of University, Country

Dear Participant,

Thank you for your interest in the details pertaining to this and the subsequent surveys you are participating in as part of this course. **PURPOSES:** The data you are providing serves a number of purposes, which include:

(1) It forms a repository of measures and evaluations on your own temporal assessments over time regarding working in your Global Virtual Team. We recommend you to download the responses upon completion of each survey. It will provide you with insights about your own learning journey throughout the series of project works and may serve you for your final assignment in the course: *'To reflect on the events you will encounter in your team, and based on these reflections generate your personal work-in-progress practice of how to organize, manage and lead in Global Virtual Teams'*.

(2) The teacher responsible for your course (who is following your learning progress over time and who will assign grades and credits for your course participation), will be provided with a summary of your responses, upon request.

(3) The coordinating team for this data collection (Professor Name(s) and potentially auxiliary technicians) will use the data on team and population level to aggregate data. This will allow you to compare your own answers over time with your reference group. All information shared on aggregate level will not reveal any individuals' responses.

(4) We will use the data for further processing and statistical analysis upon completion of all surveys. The insights gained from statistical analysis may be used for future publications in scientific journals. Step one in processing of data is the total anonymization of all data, both on individual and team level. After this step is completed, no individual information can be traced back directly to any individual. Data from those who do not provide us with full consent (beyond the purpose of finalizing assessment for the course) will be deleted. Those who answer the related question in the survey with NO are those who do not provide us with full consent.

Work with anonymized data may be in future in cooperation with academic partners, but under full supervision and responsibility of members of the coordinating team (Professor Name(s)). The main research interests relate to questions regarding how Global Virtual Teams function (examples), such as organizing, managing, leading, well-being, team development, learning, etc.

Storage of data:

(1) Storage during data collection. During the collection of data, comprising of a series of surveys, the data is stored with a contracted service provider of the University of Turku, Finland, and Microsoft Azure North Europe. This service provider is widely used by all faculties of the universities and is a trusted partner which has undergone due diligence. The operation of the service and the retrieval of information is only accessible to employees (or individuals with similar status) of the University of Turku. Specific data retrieval for the data collected here is only directly accessible by Professor Name(s).

(2) Storage after completion of data collection. Upon completion of the course, data will be extracted in anonymized form and stored in various formats to suit statistical analysis. The storage of this anonymous database will be password protected secured on servers behind the firewall of the University of Turku.

(3) Duration of data storage. The anonymized database will be stored until the end of yyyy, when it shall be destroyed. The data will not be opened for data archives, only research uses supervised by the coordinating team will be permitted.

Withdrawal at a later stage. Each participant is able to demand the exclusion of own data for further use beyond the purposes of the course you are participating in. This is possible regardless whether you have granted permission to use your data at the onset of data collection in this series of surveys or not. If you choose to withdraw from your data to be used after the course, please send an email with this request to Professor Official Email ID(s) at the latest by dd.mm.yyyy. After that, data will be anonymized and such a request cannot be fulfilled anymore as we will be unable to identify your individual responses.

The collection, storage and use of data is in line with the ethics recommendation at the University of Turku, Finland.

Privacy Notice <https://www.utu.fi/en/privacy/notice>

Data Security description of University of Turku

<https://www.utu.fi/en/privacy/data-security-description>

If you have further questions, please don't hesitate to contact Professor Official Email ID(s).

Artificial Intelligence Assistance Declaration

I, Ranjan Arora, hereby declare that I have utilized the free version of the Artificial Intelligence (AI) tool, ChatGPT, in the preparation of my research thesis titled “Quantifying Global Virtual Teams’ (GVTs) Performance Variability”, aiming to enhance the efficiency, accuracy, and depth of my work. This declaration aims to provide a clear and transparent illustration of the specific ways in which ChatGPT has contributed to my research, ensuring academic integrity and proper acknowledgment of technological assistance.

Scope of ChatGPT Utilization

Decoding Complex Literature: Understanding intricate concepts in academic literature can be challenging. With the assistance of ChatGPT, researchers can simplify complex theories and ideas more effectively. For instance, by utilizing ChatGPT to simplify the concept of “psychological safety” as discussed by Amy Edmondson, researchers can receive insightful explanations and examples that clarify its significance in organizational dynamics.

ChatGPT Input Command: *Explain the concept of “psychological safety” by Amy Edmondson in layman language with example. or*

ChatGPT Input Command: *Summarize the concept of “psychological safety” by Amy Edmondson in layman language with example from below information or paragraphs.*

(Note: Provide literature information or paragraphs after the prompt)

Clarifying Statistical Concepts: The statistical outputs of various analyses often present challenges for researchers in understanding and interpreting their significance. However, with the aid of ChatGPT, researchers can receive clear explanations and illustrative examples to grasp concepts more systematically. For example, ChatGPT can clarify the differences between R-Square and Adjusted R-Square and their respective roles in Simple Linear Regression (SLR) analysis.

ChatGPT Input Command: *Explain the concept and significance of “R-Square” and “Adjusted R-Square” in Simple Linear Regression (SLR) analysis in layman language with example.*

Citation-Free Reading: Researchers often seek to understand complex topics without the distraction of citations cluttering the text. ChatGPT can assist in removing citations from scholarly articles, allowing for a seamless reading experience. For instance, ChatGPT can eliminate citations from a research paper on Team Creativity while retaining the core informational content.

ChatGPT Input Command: *Remove the citation from the scholarly article paragraphs on Team Creativity and retain the informational content.* (Note: Provide the scholarly article paragraphs after the prompt)

IBM SPSS Data Analysis Process: The data analysis process using IBM SPSS can be streamlined with the help of clear guidelines from ChatGPT. For instance, when conducting Simple Linear Regression (SLR) analysis in SPSS, researchers generally follow specific steps such as opening the data input file, variable selection, model building, and interpretation of results. By utilizing ChatGPT, researchers can receive concise instructions tailored to their analytical needs.

ChatGPT Input Command: *Provide steps to perform Simple Linear Regression [SLR] analysis in IBM SPSS Statistics.*

Paraphrasing Content Professionally: Professional communication is essential for conveying ideas effectively in academic writing. For instance, a paraphrased version of the definition by Edmondson (1996, 164) of internal learning as “the extent to which team members engage in behaviors to monitor performance against goals, obtain new information, test assumptions, and create new possibilities” could be: ‘Edmondson (1996, 164) describes internal learning as the degree to which team members participate in activities to assess performance relative to goals, acquire new knowledge, evaluate assumptions, and generate new opportunities’.

ChatGPT Input Command: *Paraphrase the information below in a professional manner for better clarity.* (Note: Provide the internal learning definition by Edmondson after the prompt.)

Ensuring Clarity and Logical Progression: Maintaining clarity and logical progression is paramount in scholarly writing to facilitate understanding for readers. For example, in Quantitative research discussing the influence of various variables on global virtual teams’ (GVTs) performance, ensuring a clear transition from the introduction, literature

review, methodology, results, to the discussion sections is crucial for coherence and comprehensibility.

ChatGPT Input Command: *Check the clarity and logical flow of the information or paragraphs provided below. (Note: Provide the information or paragraphs after the prompt.)*

Ensuring Grammatical Accuracy: Grammatical accuracy is essential in academic writing to convey ideas accurately and professionally. Ensuring that sentences are free from grammatical errors and sound linguistically enhances the readability of research papers. By utilizing ChatGPT, researchers can ensure grammatical correctness and coherence in their writing.

ChatGPT Input Command: *Check the grammar of the sentences or paragraphs provided below. (Note: Provide the sentences or paragraphs after the prompt.)*

Translating to Native Language: Translating to native languages is crucial for understanding the context, complex information, and technical terminology within an article. Ensuring accurate and contextually appropriate translations preserves the intended meaning and cultural relevance of the original text. By utilizing ChatGPT, users can achieve high-quality translations that resonate with native speakers.

ChatGPT Input Command: *Translate the following information, text, or paragraph into the specified native language (e.g., Hindi) while maintaining its original meaning and cultural relevance. (Note: Provide the information, text, or paragraph after the prompt.)*

This Artificial Intelligence (AI) Assistance Declaration underscores a commitment to transparency, ethical integrity, and the responsible use of technology in advancing academic knowledge.

Ranjan Arora

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